

Implementation Guide to Reducing Harm from High-Alert Medications

HRET Contact hen@aha.org (312) 834-7056 www.hret-hen.org



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Adverse Drug Events (ADEs) Overview

Preventing Harm from High-Alert Medications

Background:

- Medications are the most common intervention in healthcare but are also most commonly associated with adverse events in hospitalized patients. At least 20% of all harm is associated with medication errors.
- High-alert medications are more likely to be associated with harm than other medications; they cause harm more commonly, the harm they produce is likely to be more serious, and they "have the highest risk of causing injury even when used correctly."
- Insulin, anticoagulants, narcotics and sedatives are the medications responsible for the majority of harm due to high-alert medications.

Suggested Aim:

Reduce the incidence of harm due to high-alert medications by 50% by December 31, 2013.

Potential Measures:

Outcome: Percent of high-alert medication (ADEs) per 1000 doses (aggregate, class or specific medication) Percent of admissions with a high-alert medication (ADE)

Process: Percent of patients receiving a high-alert medication (aggregate, class, or specific med) that receive a reversal agent.

Primary Drivers	Secondary Drivers		
Awareness,	✓ Assess organizational capacity, readiness and willingness to implement systems to prevent ADEs		
Readiness &	✓ Create awareness of high alert medications most likely to cause ADEs		
Education			
Standardize Care	✓ Implement ISMP quarterly action agendas where appropriate		
Processes	✓ Develop standard order sets using safety principles		
	✓ Allow nurses to administer rescue drugs based on protocol		
	 Minimize interruptions during the process of medication distribution and administration 		
	✓ Standardize concentrations and minimize or eliminate multiple drug strengths where possible		
	 Allow pharmacists to change anticoagulant doses based on lab values per protocol 		
	✓ Include a pharmacist in direct clinical activities (ICU rounds, ambulatory medication decision making,		
	etc.)		
Decision Support	✓ Include pharmacists on rounds		
	 Monitor overlapping medications prescribed for a patient 		
Prevent Failure	✓ Minimize or eliminate nurse distraction during the medication administration process		
	✓ Standardize concentrations and minimize dosing options where feasible		
	 Timely lab results with effective systems to ensure review and action 		
	✓ Use non-pharmacological methods of pain and anxiety management where appropriate		
Identification and	✓ Analyze dispensing unit override patterns		
Mitigation of Failure	✓ Prompt real time learning from each failure		
Smart Use of	✓ Use "smart pumps" with up-to-date library or double check all IV infusions for high alert medications		
Technology	✓ Understand errors that can occur from Patient Controlled Analgesic devices		
	✓ Use alerts wisely		
	 Use data/information from alerts and overrides to redesign standards 		
	✓ Link order sets to recent lab values		
Involve the Patient	✓ Allow patient management of insulin where possible		
and Family	 Provide patient education at a literacy level understandable by all 		

Making Changes:

• This intervention is in the <u>Collaborative with Reducing Avoidable Readmissions</u> (Reduce RED Collaborative). National meetings, webinars, monthly coaching calls, change packages and other tools will augment state hospital association activities.

Key Resources:

- Rashidee et al, High-Alert Medications: Error Prevalence and Severity, Patient Safety & Quality Healthcare 2009 July-Aug
- Institute for Safe Medication Practices: http://www.ismp.org/
- IHI : How to Guide Prevent Harm from High Alert Medications
- AHRQ Tools on Medication Reconciliation: http://www.ahrq.gov/qual/match/
- IHI: How to Guide Implementing Medication Reconciliation





Adverse Drug Event (High-Alert Medications) Driver Diagram

AIM: Reduce the Incidence of Harm from Adverse Drugs Events (ADEs) due to High-Alert Medications (HAMs) by 50% by 12/31/13

Primary Driver	Secondary Driver	Change Ideas
Awareness, Readiness & Education	 Assess organizational capacity, readiness and willingness to implement systems to prevent ADEs Create awareness of HAMs most likely to cause ADEs 	 Use Institute for Safe Medical Practices assessment tool¹ Assess clinical staff knowledge (pre-test); Educate; 6 week post test; Target gaps ^{2,3} HAMs – Insulin, Anticoagulants/Antithrombotics, Narcotics, sedatives
Standardized Care Processes	 Implement ISMP quarterly action agendas where appropriate¹ Develop standard order sets using safety principles Allow nurses to administer rescue drugs based on protocol without obtaining physician approval Sequence implementation by drug class 	 Review key literature ^{4,5,6,7,8} Analyze local ADE data to guide focus⁹ Use IHI "How to Guides" and "Knowledge Center" ¹⁰ and ISMP guidelines² Pick HAM drug class with highest priority and begin practice implementation instead of tackling all simultaneously INSULIN: Reduce sliding scale variation (or eliminate sliding scales) INSULIN: Coordinate meal and insulin times ANTICOAGULANTS: Use protocol to discontinue or restart warfarin perioperatively
Avoid Errors During Care Transitions	 Implement effective medication reconciliation processes Where appropriate, create ambulatory clinics for HAM follow-up 	 Reconcile all medications at each transition Use flow sheets that follow the patient through the transitions of care (not unit based but patient based) INSULIN: Require new insulin orders when patient transitions from parenteral to enteral nutrition ANTICOAGULANTS: Transition patients to warfarin clinics
Decision Support	 Include pharmacists on rounds Monitor overlapping medications given to a patient 	 Use alerts for dosage limits ANTICOAGULANTS: Use pharmacists to assist with identification of alternatives when contraindications exist ANTICOAGULANTS: Have pharmacists perform independent double checks of all VTE prophylaxis orders





Primary Driver	Secondary Driver	Change Ideas
Prevention of Failure	 Minimize or eliminate nurse distraction during medication administration process Standardize concentrations and minimize dosing options where feasible Timely lab results with effective system to ensure review and action 	 NARCOTICS/SEDATIVES: Use alerts to avoid over-sedation and respiratory arrest (with/without an Electronic Medical Record) NARCOTICS/SEDATIVES: Use alerts to avoid multiple narcotics/sedatives Perform independent double checks Use the "cone of silence" during medication administration Use visual cues like HAM specific flags at bedside INSULIN: Allow patient management of insulin where appropriate INSULIN: Set limits on high dose orders ANTICOAGULANTS: Use prepackaged heparin infusions; reduce the number of beneric constructions in the beneric.
	 Use non-pharmacological methods of pain and anxiety management where appropriate Identify "look-alike, sound-alike" medications and create a mechanism to reduce errors (e.g., different locations, labels, alternate packaging) 	 the number of heparin concentrations in the hospital ANTICOAGULANTS: Use low molecular weight heparin instead of unfractionated heparin whenever clinically appropriate ANTICOAGULANTS: Make lab results available within 2 hours ANTICOAGULANTS: Perform automatic nutrition consults for all patients on warfarin to avoid drug-food interactions NARCOTICS/SEDATIVES: Use a table of drug to drug conversion doses NARCOTICS/SEDATIVES: Use fall prevention programs NARCOTICS/SEDATIVES: Use dosing limits
Identification and Mitigation of Failure	 Educate patients/families regarding risk of ADEs from "their" HAMs Administer medications on time Analyze dispensing unit override patterns Transition to "Just Culture" environment for improved error analysis Prompt real time learning from each failure 	 Monitor, understand, and mitigate medication administration delays Assess culture with Agency for Healthcare Research and Quality Culture of Safety survey ¹¹ Use error reporting system to allow aggregate learning to redesign error prone processes Use technology to alert (real time) key staff when rescue drug administered
Smart Use of Technology	 Use "smart pumps" Understand errors that can occur from Patient Controlled Analgesic devices and other medication delivery devices Use alerts wisely Use data/information from alerts and overrides to redesign standardized processes Link order sets to recent lab values 	 ✓ Educate staff regarding unintended consequences of device use/failure ✓ Use proper level of alerts with forcing functions and stops for drug, allergy and diagnosis interactions ✓ Do not allow alert overrides without documented reason ¹²



¹ 2011 Institute for Safe Medication Practices (ISMP) Medication Safety Self Assessment [®] for Hospitals <u>http://ismp.org/selfassessments/Hospital/2011/pdfs.asp</u>
² Hsaio et al, Nurses' knowledge of high-alert medications: instrument development and validation, Journal of Advanced Nursing 66(1), 177-190
³ Lu, MC.et al, Nurses' knowledge of high-alert medications, A randomized controlled trial, Nurse Educ. Today (2011)
⁴ Institute for Healthcare Improvement High-Alert Medication Safety (Improvement Map)
http://app.ihi.org/imap/tool/#Process=b8541097-7456-4aab-a885-38c31950e6bf
⁵ Institute for Safe Medication Practices High-Alert Medications <u>http://ismp.org/Tools/highAlertMedications.asp</u>
⁶ California Hospital Association Medication Safety Committee High Alert Medication Guidelines for Select Anticoagulants
http://www.cshp.org/uploads/file/Shared%20Resources/2012/guideline_anticoagulants_2.21.12.pdf
⁷ Federico, Preventing Harm from High-Alert Medications, The Joint Commission Journal on Quality and Patient Safety, 33(9), 537-542
⁸ Graham et al,Implementation of a High-Alert Medication Program, <i>The Permanente Journal</i> 12(2), 15-22
⁹ Stavroudis et al, NICU medication errors: identifying a risk profile for medication errors in the neonatal intensive care unit, Journal of Perinatology (2010) 30, 459-468
¹⁰ Institute for Healthcare Improvement High-Alert Medication Safety Knowledge Center <u>http://www.ihi.org/explore/HighAlertMedicationSafety/Pages/default.aspx</u>
¹¹ Agency for Healthcare Research and Quality Hospital Survey on Patient Safety Culture <u>http://www.ahrq.gov/qual/patientsafetyculture/hospsurvindex.htm</u>
¹² Miller et al, Bar code Medication Administration Technology: Charcterization of High-Alert Medication Triggers and Clinician Workarounds, The Annals of Pharmacotherapy 2011 Feb Vol 45,
162-168



Prevention of Adverse Drug Events (ADE) Due to High Alert Medications:

Medications are the most common intervention in health care and are also most commonly associated with adverse events in hospitalized patients.¹ Older hospitalized patients are at higher risk of adverse drug events² in part due to their increased use of medications and co-morbid conditions such as kidney and liver disease. An increase in the number of medications increases the likelihood of drug-drug and drug-disease interactions.³

Not all medications in clinical use are of equal risk to patients. Serious adverse events appear to be caused by relatively small number of medications.⁴ The Institute of Medication Practice has identified a number of medications that they consider to be "high-alert medications."⁵ These are defined by The Joint Commission as those medications which are more likely to be associated with harm than other medications—they cause harm more commonly, the harm they produce is likely to be more serious, and they "have the highest risk of causing injury when misused."⁶

Because of the complexity of attempting to identify and prevent all ADEs, focusing surveillance and prevention of high alert medications may be a more prudent approach.⁷ The Institute for Healthcare Improvement's Five Million Lives campaign found that focusing on a few groups of high-alert medications: anticoagulants, narcotics and sedatives, and insulin would have the greatest impact. These medications, due to their high volume of use coupled with their inherent risks, are responsible for the majority of harm due to all high-alert medications.⁸

Why focus on anticoagulants?

- Lack of dosing guidelines and appropriate monitoring can lead to serious harm associated with this class of medications.⁹
- Anticoagulants account for 4% of preventable ADEs and 10% of potential ADEs.¹⁰
- Anticoagulation therapy is associated with serious and frequent ADEs in both inpatients and outpatients.¹¹
- Warfarin is commonly involved in ADEs for a number of reasons:
 - o the complexity of dosing and monitoring
 - o patient compliance
 - o numerous drug interactions
 - o dietary interactions that can affect drug activity ¹²
- There is considerable variation in ordering, dosing, and monitoring of patients on unfractionated heparin. Often, there is confusion over providing ongoing therapy while patients are receiving warfarin.⁸

Why focus on narcotics?

- Opioid overdose or underdose associated with respiratory depression or poor pain control was a contributing factor common in adverse events.¹¹
- A collaborative of pediatric hospitals led by Child Health Corporation of America (CHCA) identified a rate of 5.2 narcotic-related ADEs for every 100 patients.¹³
- Patient-controlled analgesia (PCA) poses potential for harm. Episodes of respiratory depression are
 associated with drug interactions, continuous narcotic infusion, nurse- or physician-controlled analgesia,
 and inappropriate use of PCA by patients.¹⁴
- Mortality from user programming errors with PCA pumps have been estimated to be a low-likelihood event (ranging from 1 in 33,000 to 1 in 338,800), but relatively numerous in absolute terms (ranging from 65 to 667 deaths).¹⁵

Why focus on sedatives?

Harm may result when clinicians are not aware of the onset of action, are titrating to effect without
considering upper dose limits, and lack a process to address emergency situations such as respiratory
depression and arrest.



- Multiple sedative uses accounted for 42% of preventable ADEs in the intervention group.¹⁶
- Sedative use in the elderly is considered particularly high risk by the Institute of Safe Medication Practices. It has also been shown to be associated with a higher rate of falls among this group of patients.¹⁷

Why focus on insulin?

- The pharmacology of the drug, complexity of dosing, and variety of products all contribute to the potential for error and associated harm.
- Hypoglycemia is the most common complication of insulin therapy and is an extremely frequent adverse event in hospitals worldwide.¹⁸
- Even when hospitals use protocols and guidelines, there continue to be adverse events. Adjustments are not made to dosing to take into account stress caused by illness or a medical procedure, or when a patient may not have adequate food/caloric intake.¹⁹

Suggested Aims:

- Reduce the incidence of harm due to high-alert medications by 50% by December 31, 2013.
- Reduce high-alert triggers on the Medication Trigger Tool by 25% by December 31, 2013.

Awareness, Readiness & Education:

While medication errors have been on the radar of hospitals for the last two decades, the focus has been on administration by nurses. This focus has led to the campaign called The Five Rights: Right Patient, Right Drug, Right Dose, Right Route, and Right Time. The focus on these five rights has often led to the punishment of nurses for "their errors" rather than understanding the system failures that led to the error and redesign of those systems to prevent errors.

A "culture of blame" has not lead to improved medication safety. Given that realization, healthcare is starting to turn to a very different concept: "Just Culture." Developed by David Marx, "Just Culture" can be defined as "one that learns and improves by openly identifying and examining its own weaknesses. Organizations with a Just Culture are as willing to expose areas of weakness as they are to display areas of excellence. Of critical importance is that caregivers feel that they are supported and safe when voicing concerns. Individuals know, and are able to articulate, that they may speak safely on issues regarding their own actions or those in the environment around them."²⁰

Secondary Driver: Assess Organizational Capacity, Readiness and Willingness

Capacity is often thought of as number of people available to do a task. However, the organizational capacity, readiness and willingness to examine and change systems of care to prevent medication errors are truly about the culture of the organization. Assessing the culture globally, but also at the unit specific level or roles specific level can lead to insight as to the barriers that impede an organization from reaching optimal medication safety.

Secondary Driver: Create Awareness of HAMs Most Likely to Cause ADEs

Research has shown that creating and using a tool that assesses organizational practices and knowledge, using that assessment to educate and close gaps, then reassessing at a defined period in the future, can improve organizational knowledge and awareness of the risks of HAMs. It is then extrapolated that this increased knowledge and awareness will lead to fewer errors.



Change Ideas: Methods to Enhance Organizational Awareness

- Use Institute for Safe Medical Practices (ISMP) self-assessment too.l²¹
- Assess clinical staff knowledge (pre-test); Educate; 6 week post-test; Target gaps.^{22,23}
- Use a well-developed patient safety culture survey instrument like the SAQ²⁴ or AHRQ Patient Safety Instrument.²⁵

Suggested Process Measures:

- ISMP self-assessment results focus on safe practices not widely implemented.
- Counts of high-alert medication triggers from the Medication Trigger Tool by drug class.
- The rate of high-alert triggers from the Medication Trigger Tool by class of drug per 100 patients receiving a drug in that class.
- The rate of high-alert triggers from the Medication Trigger Tool by class of drug per 1000 doses of a drug in that class.

"Hardwiring" Awareness, Readiness, & Education as part of Improvement Plan:

Regular assessments of performance are important for hardwiring awareness, readiness and education. Utilize the ISMP self-assessment tool at least annually and note progress in every section where weakness is identified.

Standardized Care Processes:

Standard work can create standard outcomes. Medicine is complex and not everything can be standardized, but to quote Brent James M.D. of the Intermountain Health, "Standardize what is standardizable and no more." Standard orders and protocols can be written so that they can incorporate specific patient characteristics such as kidney or liver disease, advanced age, or others. These customized approaches to individual HAMs can be a part of routine practice; they can be built in and systematized.

Secondary Drivers: Implement ISMP Quarterly Action Agendas Where Appropriate²⁶

The ISMP quarterly action agendas synthesize the latest safe practices in a variety of areas based on self-report, queries and other mechanisms to identify unsafe medication practices. Not all are appropriate for every hospital (some are specific to medication uses only in sophisticated settings) and hospitals can focus on those representing high-alert medications.

Secondary Drivers: Develop Standard Order Sets

Work with physicians and pharmacists to develop standard order sets for high priority HAMs. Use well-described safety principles in standard order sets.

Secondary Drivers: Allow Nurses to Administer Rescue Drugs Based on Protocol

Protocols for use of rescue medications, such as Narcan®, glucose, flumazenil can be established for non-physician use. Vitamin K is another rescue agent, as is Fresh Frozen Plasma and hematologic factors; however, its uses are best discussed with physician and possibly pharmacy participation for major bleeding issues.

Secondary Drivers: Sequence Implementation by Drug Class

Rather than address all high-alert medications, start with the drug class where the greatest opportunity for improvement exists and finish that class before beginning with another class. You can use the results from the ISMP self-assessment tool, Medication Trigger Tool or perhaps incident reports to determine which class should begin first. Another strategy is to pick the class with the least amount of complexity in an institution and implement all of the safety aspects with that class prior to starting another.



Change Ideas:

- Review key literature ^{27, 28, 29, 30, 31}
- Create standard orders
 - Obtain example order forms and ask: "What would we need to modify to make this work here?"
 - o Allow flexibility within the orders based on common patient characteristics.
 - Allow for "opt out": this allows the clinician to not use the standard orders because they do not "fit" the patient.
 - Capture the logic of the "opt-out" on the standard orders so the "opt-outs" can be aggregated, creating learning that leads to improvement.
 - Make it easier for a physician to use the standard orders than to write orders.
- Institute for Healthcare Improvement "How to Guides" and "Knowledge Center" ³² and ISMP guidelines³³
- **INSULIN:** Reduce sliding scale variation.³⁴
- INSULIN: Coordinate meal and insulin times.
- **ANTICOAGULANTS:** Use protocol to discontinue or restart warfarin perioperatively.³⁵

Suggested Process Measures:

- The percent of patients for whom a protocol is used for perioperative warfarin.
- The percent of patients for whom a standardized risk screening for venous thromboembolism (VTE) tool is used.
- The percent of patients who receive protocol driven risk based VTE prophylaxis.
- The number of transfers to a higher level of care that occurred because of VTE prophylaxis.

"Hardwiring" Standardized Care Processes as Part of Improvement Plan:

The organization should make it easy for the clinician to perform the desired activity. Understanding the care process on the various units by involving local clinicians in the design of processes will increase effectiveness. For example, physicians should not only be involved in defining the order sets but also how the order sets will be prompted to them.

Avoid Errors During Care Transitions:

Transitions of care, whether from nurse to nurse, physician to physician, or unit to unit are a common and dangerous source of error. ^{36,37} While solutions remain elusive, proven processes do exist that can prevent or mitigate errors.

Secondary Drivers: Implement Effective Medication Reconciliation Processes

While "easier said than done," getting the medication correct at each transition of care remains a critically important process. This is especially true on admission and discharge. Some hospitals use pharmacy technicians to aid in this process at both ends of the hospitalization.

Secondary Drivers: Where Appropriate, Create Ambulatory Clinics for HAM Follow-up

A large portion of HAM issues presents in the emergency department due to inadequate ambulatory medication management. A common presentation is a critically elevated INR due to excessive warfarin (Coumadin). Ambulatory Coumadin® clinics run by hospitals in some locations have reduced these problems dramatically and depend on local community resources and physician + lab availability. Ample evidence exists now that mid-level professionals who work from protocols and manage warfarin daily have outstanding results. ³⁸ Many institutions are now using either their own post discharge warfarin clinics or providers within the community have created this within their own offices. Often they involve a pharmacist or nurse practitioner to provide adjustments to dosing based on a protocol.



Change Ideas:

- Reconcile all medications at each transition.
- Use medication tools that follow the patient through the transitions of care (not unit based but patient based).
- **INSULIN:** Require new insulin orders when patient transitioned from parenteral to enteral nutrition.
- ANTICOAGULANTS: Transition patients to warfarin clinics.

Suggested Process Measures:

- The percent of medications reconciled at each transition of care.
- The percent of patients receiving anti-coagulation therapy who are followed in focused anti-coagulation ambulatory centers.
- The percent of patients on insulin who receive new orders when removed from parenteral feedings to enteral feedings.

"Hardwiring" to Avoid Errors During Care Transitions as Part of Improvement Plan:

Medication reconciliation tools that serve for both ordering and reconciliation can help to hardwire this process. These can be created for both paper and electronic ordering systems. Standard discharge order sets with an automatic referral of patients on anticoagulation at discharge, facilitated by a nurse who handles these transitions, can help make this process a part of standard care. Also, exception reports regarding when reconciliation is incomplete can help identify problems with sustainability issues.

Decision Support:

Decision support provides additional information, problem solving, and controls to prevent adverse drug events. Decision support is a concept where just-in-time information helps clinicians make more informed and accurate decisions. Often, technology solutions provide decision support. For example, smart pumps make dosing adjustments and calculations available at the point of care. Alerts on electronic prescribing platforms can look for dosing errors and drug sensitivity data being available when prescribing antibiotics can decrease the use of incorrect agents. In fact, medication manuals on the nursing station are a form of decision support.

Secondary Drivers: Include Pharmacists on Rounds

Pharmacist participation in medical rounds significantly reduces the rate of ADEs caused by prescribing errors, both in an ICU setting³⁹ and general medical units⁴⁰.

Secondary Drivers: Monitor Overlapping Medications Prescribed for a Patient (Multiple Narcotics, Sedatives, Anti-Psychotics)

Consider establishing criteria for clinical pharmacist intervention to include both specific medications and the number of total medications.

Secondary Drivers: Use Smart Pumps, Bar Code Technology

Hospitals have implemented the use of smart IV pumps to support appropriate dosing, flows and need to change medication bags. Smart pumps are not infallible, however, and can create unintended consequences. Some facilities also use barcode technology to reduce medication errors during administration. Although helpful, it does not detect all errors and can be overridden: often when appropriate, occasionally when it is not.

Change Ideas:

- Use alerts for dosage limits.
- Monitor override patterns for barcode, automated dispensing units and other technology tools that create forcing functions.



- ANTICOAGULANTS: Use pharmacists to assist with identification of alternatives when contraindications exist.
- ANTICOAGULANTS: Have pharmacists perform independent double checks of all VTE prophylaxis orders.
- NARCOTICS/SEDATIVES: Use alerts to trigger monitoring to prevent over-sedation and respiratory arrest (with/without an Electronic Medical Record).
- NARCOTICS/SEDATIVES: Use alerts to avoid multiple narcotics/sedatives.

Suggested Process Measures:

- The rate of "overrides" for automated dispensing units, bar codes and other technology (Note: there is no "ideal" override rate but high rates can indicate a problem as well as growing rates over time).
- The percent of VTE prophylaxis orders that have independent double checks performed.

"Hardwiring" Decision Support as Part of Improvement Plan:

Many of the interventions are not only implementation strategies but also hardwiring strategies. Including pharmacists in rounds as a full member of the patient care team and implementing alerts are examples of hardwired interventions.

Hardwiring the double check process may include regular monitoring, both by chart review and observation. For technology solutions, hardwiring means ensuring that the technology is being used appropriately, with a systematic audit process, as well as anticipating unintended consequences that generate overrides.

Prevention of Failure:

Medication errors are the most frequent cause of adverse drug events.^{41,42} Effective system and process designs can decrease medication errors.

Secondary Driver: Minimize or Eliminate Nurse Distraction During Medication Administration Process

Most medication errors are commonly attributed to system failures, with distractions/interruptions as a contributing factor.⁴³ One study cites as many as 30 interruptions in a single nursing shift.⁴⁴ Minimizing distractions is part of creating a safe work environment. Implementing visual cues, such as a "medication sash" or designated, clearly identified areas for medication preparation can reduce the number of distractions. These visual cues signal a "cone of silence," i.e. the nurse should not be interrupted.

Secondary Driver: Standardize Concentrations and Minimize Dosing Options Where Feasible

Multiple concentrations and multiple dosing options can lead to error. One of the first nationwide changes occurred over thirty years ago when there were two concentrations available for regular insulin: 40 units/mL (U-40) or 100 units/mL (U-100). Many episodes of unintended hypoglycemic events occurred when patients who had been on U-40 where given the same doses but of the U-100 concentration. These same principles apply to all high-alert medications. Too many options in dosing may lead to failure and sometime catastrophe (e.g., adult heparin in NICUs).

Secondary Driver: Timely Lab Results With Effective System to Ensure Review and Action

An established plan for monitoring should be implemented with all high alert medications, including type and frequency of monitoring. When laboratory values are used to monitor effects of HAMs, protocols for ordering, reviewing, and reporting these values should be implemented.



Secondary Driver: Use Non-Pharmacological Methods of Pain and Anxiety Management Where Appropriate

Changing environmental factors (lowering bright lights, decreasing noise levels, and achieving optimal temperature) can help manage a patient's pain and/or anxiety. Other ideas include the use of aromatherapy, distractions, music and touch therapy.

Secondary Driver: Manage "Look-Alike, Sound-Alike" Medications

Hospitals should create a list of look-alike/sound-alike medications it stores, dispenses, or administers and implement strategies to minimize potential errors for each. Such strategies include TALLMAN Lettering, separation on shelves and in unit based dispensing machines.

Change Ideas:

- Perform independent double checks.
- Use the "cone of silence" during medication administration.
- Use visual clues like HAM specific flags at bedside.
- INSULIN: Allow patient management of insulin where appropriate.
- INSULIN: Set limits on high dose orders.
- ANTICOAGULANTS: Use prepackaged heparin infusions; reduce the number of heparin concentrations in the hospital.
- ANTICOAGULANTS: Use low molecular weight heparin instead of unfractionated heparin whenever clinically appropriate.
- ANTICOAGULANTS: Make lab results available within 2 hours; create a closed system for elevated lab result management.
- ANTICOAGULANTS: Perform automatic nutrition consults for all patients on warfarin to avoid drug-food interactions.
- NARCOTICS/SEDATIVES: Use a table of drug-to-drug conversion doses.

Suggested Process Measures:

- The percent of critical inpatient lab results for patients receiving selected HAMs that have no documented action (failure rate).
- Medication pass (distribution) errors observational.
- The number of interruptions during medication administration processes.
- The percentage of patients prescribed narcotics/sedatives that also receive non-pharmacological methods of pain and anxiety management.

"Hardwiring" Prevention of Failure as a Part of the Improvement Plan:

Many of the interventions are not only implementation strategies but also hardwiring strategies. Standardizing concentrations, setting dosing limits and using prepackaged heparin for infusion are examples of hardwired interventions.

Hardwiring for ADE prevention may include routine reminders for double checks at the bedside by two licensed caregivers. Observations and chart reviews may also be used. If using an electronic medical record, implement a hard stop for the documentation of the double check.

Identification and Mitigation of Failure:

Once an ADE does happen, prompt identification and mitigation can reduce adverse outcome for the patient. Identification can also provide opportunities for learning and system redesign.



Secondary Drivers: Educate Patients/Families Regarding Risk of ADEs

Patients and families can be an ally with medication safety. In addition to staying alert for early warning signs, helping them to understand the benefits and potential risks of medications in their care will activate their role upon discharge. Education regarding self-management is much easier if the patient and caregiver are involved throughout the hospitalization with their medication management.

Secondary Driver: Transition to "Just Culture" for Improved Error Analysis

As previously mentioned, a "culture of blame" has not led to improved medication safety. As organizations become more successful implementing the "Just Culture," they concomitantly see improvements in reporting, more comprehensive error analysis and a greater likelihood of adopting system changes that lead to sustainable reductions in errors.

Secondary Driver: Prompt real time learning from each failure

Hospitals that learn rapidly and thoroughly from each failure and substantive "near miss" during medication management issues are better able and positioned to successfully implement safe practices. Understanding the actions and events shortly after an error occurs reduces memory bias. However, it is also a time that can be emotionally charged due to individual responses to errors and relating to patients, families, even colleagues. Yet, understanding failure and taking a broad systems view is crucial to reduction medication errors. Many recommend asking at least five "whys" when investigating an accident to force respondents to think about other influences that had an impact.

Change Ideas:

- Use clinical pharmacists to educate patient/family on their HAM(s).
- Monitor, understand, and mitigate medication administration delays.
- Assess culture with Agency for Healthcare Research and Quality Culture of Safety survey.¹¹
- Use error-reporting system to allow aggregate learning to redesign error prone processes.
- Conduct an interdisciplinary failure modes and effects analysis (FMEA) in a non-punitive manner on prior ADE events to learn system breakdowns, knowledge gaps, and opportunities to correct for system redesign.
- Use technology to alert (real time) key staff when a rescue drug is administered.

Suggested Process Measures:

- Counts of "triggers" form the Medication Trigger Tool for HAMs.
- Percentage of patients re-admitted due to ADE complication.
- Medication pass (distribution) errors observational.

"Hardwiring" Identification and Mitigation of Failure as Part of Improvement Plan:

Many of the interventions are not only implementation strategies but also hardwiring strategies. Hardwiring for ADE prevention includes:

- Routine reminders for double checks at the bedside of HAMs by two licensed caregivers . (If using an electronic medical record, implement a hard stop for the documentation of the double check)
- Automatic notification of a pharmacist when rescue medications are administered.
- Routine review of anticoagulant orders by clinical pharmacists for appropriate dosage based on patient age and laboratory results.

Smart Use of Technology:

Utilizing technology effectively will help to identify and to mitigate errors. Technologies such as physician order entry, physician decision support, bar code scanning, and smart pumps, to name a few, have been demonstrated to improve drug safety.^{45,46} Technologies such as these can: be used to identify errors made, identify steps leading



to those errors, prevent prescribing errors by using approved dosages and decision support, and prevent administration errors in any of the '5 Rights..⁴⁷

Secondary Driver: Understand Potential Errors That Can Occur From Medication Delivery Devices

Automated devices, such as Patient Controlled Analgesia (PCA) pumps and smart pumps, can have unintended consequences. Since they are often used with HAMs, understanding the potential for errors for these devices is crucial to mitigating harm. Working with device manufacturers, reviewing the SMP website, and other literature and reports about potential errors gives a starting point to anticipating potential device errors.

Secondary Driver: Use Alerts Wisely

• Overuse of alerts and hard stops can cause alert fatigue and frustration. This frustration can lead to the use of work-arounds that may be unsafe.

Secondary Driver: Use Data/Information From Alerts and Overrides to Redesign Standardized Processes

Requiring documentation for overriding makes the clinician think twice about going outside of guidelines and protocols. Furthermore, the "override reason" data can be mined to target education or improve the protocol. Additionally, measuring the override rate can provide clues about trends and patterns.

Secondary Driver: Link Order Sets to Recent Lab Values

Lab values for anticoagulants and antithrombotic agents need to be linked to a closed loop mechanism to ensure that they are seen, evaluated, and acted upon; this includes reevaluating the current treatment based on the lab values. Another option is to create a pharmacy driven protocol that allows for more immediate adjustment without a physician's order.

Change Ideas:

- Educate staff regarding unintended consequences of device use/failure
- Use proper level of alerts with forcing functions and stops for drug allergy and diagnosis interactions
- Do not allow alert overrides without documented reason ⁴⁸

Suggested Process Measures:

• The device override rate (Note: An absolute "correct" rate is a myth; rather high-rates or increasing rates may indicate a potential safety problem or workflow issues causing more overrides)

"Hardwiring" Smart Use of Technology as Part of Improvement Plan:

Soft stops, hard stops, and alerts are all examples of hardwiring. A soft stop is a reminder that requires no action. It can be passed by pressing a key or clicking the mouse. A hard stop requires action. It cannot be passed without an appropriate action.

Potential Barriers:

- Recognize that for many physicians this will be a change in their practice. The use of alerts and stops and decision support may be new and invoke feelings of loss of control and "being told how to practice medicine." The recruitment of a physician champion or two that are well-respected among their physician colleagues will be crucial to help engage physicians in new processes and use of technology.
- These processes may be new territories for many physicians, nurses, and pharmacists. Technology involves
 a learning curve. Different practitioners will adapt at different rates.
- Physicians may resist standard orders, believing they are "cookbook medicine." Educating the physicians as to the actual nature of standard order sets, including both the built-in options for customization as well as the option for "opt out" can mitigate this resistance and increase adoption. Nurses may have many



fears in giving rescue medications by protocol without specific physician order. These fears may include creating patient harm, being disciplined, or receiving negative feedback from physicians. It is important that both nursing and physician leadership support these nurse driven orders and intercede when inappropriate behavior occurs.

- Some physicians are very uncomfortable reconciling medications ordered by other physicians. When asked about this hesitancy, medical legal liability along with lack of knowledge of certain drugs is the most common answer.
- Additionally, physicians may be circumspect about protocol operated by pharmacists, nurses or nurse practitioners. Some may have had a long track record of successful management of warfarin while many simply may be unaware of the advantages of these clinics.
- Technology for installing dosage and multiple (duplicative) therapy alerts may not be available at every facility.
- Resistance to the "cone of silence" may occur. Physicians' and other caregivers' workflow may be impacted if they need to wait to talk with a patient's nurse. The urge to interrupt with a "quick question" may be difficult to suppress.
- Nurses maybe uncomfortable providing rescue interventions based on a protocol without calling the physician first. Support by physician and nurse leadership and education on the benefits of such protocols could help to mitigate this resistance.

Use Administrative Leadership and Sponsorship to Help Remove or Mitigate Barriers:

- Executive, clinical, and human resource leaders must lead this effort. Leaders who employ blame and shame for errors drive them underground. It is critical that human resources and legal staff understand the new approach.
- Senior physician, senior nursing, and senior pharmacy management will be critical to the success of new innovations like we have discussed in the section. These may be perceived as something punitive (*timeliness audits*), something new and unfamiliar (*Consult a pharmacist? What's a hard stop?*), or additional work (independent double checks before administering a HAM).
- Physician leadership will be key. The data regarding the efficacy of both medication reconciliation and protocol driven warfarin clinics, coupled with the literature which supports these activities, and finalized by stories of the effects on patients when the when the traditional processes fail, will help overcome these barriers. As these processes prove to be in the best interest of patients (and in some cases easier for physicians), more and more physicians will adopt them until a critical mass is reached, transforming the quality of care.
- Senior leadership and pharmacy management support is critical to the implementation of double check requirements, as it may be seen solely as additional work.
- Purchasing and implementing new technology takes resources. Administrative leadership's support for securing the necessary resources to achieve goals in prevention of ADEs is essential. Phasing in capital purchases to the areas with highest yield can improve leadership willingness to support ADE programs.

This is Not Just a Change in Practice but May Also be a Change in Culture:

- This now should be obvious: improving medication safety is a clear move from a culture of blame to a culture of learning and system improvement. It is not, however, a creation of a blame-free environment. Reckless and unjustified behavior should not be tolerated.
- Standard processes work. As healthcare providers become more comfortable with them, the culture in fact changes. Clinicians can then focus on the patient characteristics that require deviation from standard work. Collectively, this combination of processes has been shown to outperform traditional methods.^{49,50}



- Including pharmacists in patient rounds and as consultants may require a change in culture. The concept of teaming is an important one to understand and that changes may be necessary. The change in practice may require education/in-services/simulation to improve caregivers' communication and conflict resolution skills.
- This is an example of an innovation that will require small test of changes and a planned spread driven by success. The ideal end result is the development of team based care where each member of the team (physician, nurse, respiratory therapist) contributes to better and safer patient care.

Tips for How to Use the Model for Improvement:

- Start safe. Trust is slowly earned. Consider beginning with the ARQH Culture of Safety tool ⁵¹ and the Institute of Safe Medication Practices self-assessment tool. ²¹
- Create a multi-disciplinary team representing key stakeholder groups. Pick a HAM based on one of these common classes or your own data.
- Trial the use of a new smart pump on one unit where pumps are used frequently, e.g. an intensive care unit.
- Pilot the use of pharmacists in clinical rounds on one unit or with one physician. Utilize the successes of this pilot to accelerate adoption.
- Pilot a program to minimize distraction during the medication administration process. Use data (# of interruptions, # of errors) to gain buy-in from physicians and other caregivers.
- Implement the double check policy of HAMs incrementally, reviewing for actual/potentials issues (e.g. delay of treatment), resources required and resource constraints.
- Design a small pilot on the unit where the lead physicians and nurses are comfortable with testing these medication administration design changes and protocols. To cite one study where they tried it in one unit, "The presence of a pharmacist on rounds as a full member of the patient care team in a medical ICU was associated with a substantially lower rate of ADEs caused by prescribing errors. Nearly all changes [99%] were readily accepted by physicians."⁴²



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On the CUSP: Stop CAUTI Implementation Guide

A Practical Resource for Improving Safety in Your Unit



Prepared for:

Agency for Healthcare Research and Quality (AHRQ)

U. S. Department of Health and Human Services (HHS)

Contract Number: 290-06-00022I-8

Contract Title:

National Implementation of the Comprehensive Unit-based Safety Program (CUSP) to Reduce Catheter-associated Urinary Tract Infection (CAUTI)

Contractor:

Health Research & Educational Trust, Chicago, IL

Prepared by:

Health Research & Educational Trust

Michigan Health & Hospital Association Keystone Center for Patient Safety & Quality

Johns Hopkins University Quality and Safety Research Group

Ann Arbor VA Medical Center and the University of Michigan Patient Safety Enhancement Program

St. John Hospital and Medical Center

Updates:

March 2012- Updated Section VIII to be in alignment with project phases.

March 2012

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Project Overview

The Purpose of this Manual

This manual will help your team implement *On the CUSP: Stop CAUTI* in your patient care units that have committed to reducing catheter-associated urinary tract infections (CAUTI) and improving safety culture. This manual describes the collaborative model, presents teamwork and project management tools, delineates roles and responsibilities of unit-level project leaders, and defines measures of success for the program. To assist states and unit teams with the implementation of this project, this manual provides brief overviews of the concepts and processes to be applied as well as more detailed recommendations on how to implement the *On the CUSP: Stop CAUTI* project.

This manual is intended to serve as a resource for your team in implementing *On the CUSP: Stop CAUTI*. It is supplemented by templates, tools, and educational conference calls and webinars, many of which are available in the appendices as well as on the national project web site, <u>www.onthecuspstophai.org</u>. Additionally, state-level support is available for unit teams from State Hospital Associations (SHAs).

Although this manual provides step-by-step guidance on completing project implementation activities, it is important to acknowledge that these are guidelines to which you should apply your own local experience and expertise.

Problem

Health care-associated infections (HAIs) are one of the most common complications of hospital care. Nearly two million patients develop HAIs annually, which contribute to approximately 99,000 deaths and \$28 billion to \$33 billion in health care costs.¹ Given the importance of HAIs in reducing costs and improving patient safety, Health and Human Services Secretary Kathleen Sebelius, joined by leaders of major hospitals, employers, health plans, physicians, nurses, and patient advocates, on April 12, 2011 announced the launch of the Partnership for Patients initiative. This new national partnership is intended to save 60,000 lives by stopping millions of preventable injuries and complications in patient care over the next three years. Reducing CAUTI is part of the national HAI initiative, which aims to save up to \$35 billion in health care costs, including up to \$10 billion for Medicare. CAUTIs are the most common type of HAI in U.S.

hospitals and account for 35 percent of all such infections.² The estimated total U.S. cost per year for CAUTI is \$565 million, and the estimated number of deaths per year is 8,205.¹

Six hundred thousand patients develop hospital-acquired UTIs each year, and CAUTIs comprise around 75 percent of these cases.^{3, 4} Research suggests CAUTIs are preventable and that perhaps as many as 50 to 70 percent of these episodes are preventable.^{5, 6}

Patients with indwelling urinary catheters are at greater risk for developing UTIs with risk of bacteriuria increasing with each day of use:

- Per day: ~5 percent
- 1 week: ~25 percent
- 1 month: ~100 percent

The leading risk factors of CAUTI include prolonged catheterization, female gender, and catheter insertion outside of the operating room.⁷

About 15 to 25 percent of patients will have a urinary catheter placed during their hospitalization. Many of these catheters are placed either in the intensive care unit, emergency department, or the operating room. Up to 50 percent of patients from non-intensive medical and surgical units may not have a valid indication for urinary catheter placement thus contributing to the high rate of CAUTI.⁷ Approximately one-third of physicians in a 2000 study by Saint et al. were not aware that their patients even had an indwelling urinary catheter.²

Due to the magnitude of this problem and because these infections are often preventable, the Centers for Medicare & Medicaid Services (CMS) has included CAUTI on their list of hospital-acquired conditions for which it will no longer reimburse. In a 2007 study, cases with CAUTI resulted in \$1,300 to \$1,600 in additional cost per patient.⁸

In addition to cost and risk of infection, an even more immediately compelling reason to reduce the use of indwelling catheters is patient discomfort.⁹ A report of Veteran's Health Administration patients found that nearly 50 percent of patients found indwelling catheters to be uncomfortable and painful. In addition, indwelling urinary catheters restrict patients' ability to ambulate.¹⁰

Goals

Recently, there have been demonstrations of a successful approach to reducing the use of indwelling urinary catheters.¹¹ The Michigan Keystone: Hospital-Associated Infection project is a statewide initiative that began in 2007 that is reducing the use of urinary catheters. Over the course of the first two years, the participating units successfully achieved and sustained a reduction of approximately 25 percent in the use of urinary catheters.¹² Based on these efforts and the success in Michigan, the Agency for Healthcare Research and Quality (AHRQ) has funded the Health Research & Educational Trust, the Michigan Health & Hospital Association (MHA) Keystone Center for Patient Safety & Quality, St. John Hospital and Medical Center, the University of Michigan's Patient Safety Enhancement Program, and the Johns Hopkins University Quality and Safety Research Group (JHU QSRG) to lead the On the CUSP: Stop CAUTI project to reduce catheter-associated urinary tract infections (CAUTI) and to improve unit safety culture. This national project focuses on two clinical interventions for indwelling catheters: 1) Appropriate Insertion; and 2) Appropriate Care and Removal. In addition to the clinical interventions, the project focuses on improving unit safety culture using the Comprehensive Unit-based Safety Program (CUSP) developed by the Johns Hopkins University Quality and Safety Research Group (JHU QSRG).

The national goals of On the CUSP: Stop CAUTI are twofold:

- 1. Reduce mean CAUTI rates in participating clinical units by 25 percent
- 2. Improve safety culture, as evidenced by improved teamwork and communication, by disseminating the CUSP methodology

The unit-level objectives of the project include:

- 1. Promote the appropriate use of indwelling catheters
- 2. Improve the culture of safety, teamwork, and communication
- 3. Improve proper placement technique and care of the catheter

Solution

To achieve CAUTI reduction, improve unit safety culture, and sustain these improvements, a strategy to address both technical and adaptive problems is necessary. A technical problem is a problem that is readily identified with known solutions. CAUTI and its prevention interventions are the technical component. An adaptive problem is less easily identified, and the solutions are not always apparent. A focus on adaptive components addresses the unit team's values, attitudes, and beliefs, qualities often collectively referred to as *culture*. Addressing either

technical or adaptive challenges—but not both—may not result in the success you are trying to achieve.

To meet the goals of this national and local initiative, all of the following pieces of the *On the CUSP: Stop CAUTI* project need to be implemented:

- Adaptive and Technical Interventions
- Education and Coaching Support
- Measures of Success
- Project Infrastructure

The combination of these activities and the project infrastructure makes the implementation and spread of this work possible across states, hospitals, and units. Each activity is introduced in this section of the manual.

Adaptive and Technical Interventions

The *On the CUSP: Stop CAUTI* project includes the following adaptive and technical interventions to reduce CAUTI:

ADAPTIVE

- 1. 4 E's Model
- 2. The Comprehensive Unit-based Safety Program (CUSP)

TECHNICAL

- 3. Appropriate Insertion Intervention
- 4. Care and Removal Intervention

Over the course of this project, your team will be provided with the information to implement each of these interventions. A summary of each intervention follows below with greater detail for each intervention provided in sections five and six.

1. The 4 E's Model

The JHU QSRG developed the 4 E's model to help implement patient safety interventions. This model includes four key elements: Engage, Educate, Execute, and Evaluate.¹³

Step 1: Engage. Unit teams help staff understand the impact of preventable harm caused by CAUTI by sharing stories about patients who develop these infections, and by estimating the number of patients who are harmed given the unit's current infection rates.

Step 2: Educate. Unit teams ensure staff and senior leaders understand what they need to do to prevent infections.

Step 3: Execute. Execution is based on the principles of safe system design: simplify the system, create redundancy, and learn from mistakes.

Step 4: Evaluate. Using standardized NHSN definitions for CAUTI, teams will regularly collect and submit CAUTI rates along with the prevalence and appropriateness of urinary catheter use.

This model will be used in conjunction with the CUSP model to help unit teams create change and improve patient safety in their units.

2. The Comprehensive Unit-based Safety Program (CUSP)

CUSP is a model designed to improve patient safety on a clinical unit by providing a common platform for understanding the science of safety, then integrating key habits and steps into the daily routines of a unit or clinical area. CUSP draws on the wisdom of frontline providers who have practical knowledge regarding safety risks to their patients and provides a mechanism to help analyze and reduce the risk of those hazards. The CUSP model has five components: science of safety, identifying defects, executive adoption of the unit, learning from defects, and implementing teamwork and communication tools. In addition to these five components, CUSP emphasizes the importance of a diverse team, focuses on the input of direct care providers, discusses the importance of a common goal, identifies issues that the team can successfully solve, and integrates these elements as part of the team's routine work. Similarities to important components and teachings found in CUSP can be found in the literature on other change leadership models listed in the comparison <u>table below</u>.

Table 1: Model Comparison Table

	Culture Change Model			
Objective	CUSP	Kotter: Leading Change	Kouzes and Posner: Leadership Challenge	As Applied to CAUTI
Developing Engagement	ENGAGE, EDUCATE Science of Safety, the Josie King Story	Create a Sense of Urgency	Encourage the Heart	Describe appropriate indications/processes to improve appropriate care, insertion, and removal when catheter is no longer indicated
Team Development	ENGAGE, Senior Leader Partnership with the CUSP Team	Create a Guiding Coalition	Model the Way	
Developing Alignment	ENGAGE, "What hill do we climb?"	Develop a Shared Vision	Inspire a Shared Vision	
Sharing Approach		Communicate the Vision		
Empowerment	EXECUTE, Direct Care Provider involvement, Teamwork and Communication Tools	Empower Others to Act	Enable Others to Act	Assess for catheter presence and indication. Remove when no longer needed. Do not place catheter unless it is an appropriate indication.
Implementing Change	ENGAGE, EXECUTE, EVALUATE, Learning from Defects	Generate Short Term Wins	Challenge the Process	Improve utilization practices, evaluate improvement in compliance with indications and in symptomatic CAUTI
Spread	ENGAGE, EXECUTE EVALUATE, Learning from Defects	Consolidate Gains and Produce More Change		
Sustainability	Part of the Daily Work	Anchor New Approaches in Culture		

The components of CUSP provide strategies, information, and tools that can be adapted to use elsewhere in your organization.

CUSP is associated with improvements in patient safety, clinical outcomes, and safety culture.^{12,} ^{14, 15, 16} In the context of CUSP, culture has been diagnostic of unit strengths and weaknesses, responsive to interventions, and relevant to the unit frontline providers. Moreover, in the work with the Michigan *Keystone: ICU* program, linking culture through CUSP with focused clinical

interventions (for example, to reduce central line-associated bloodstream infections (CLABSI) led to sustained reductions in infection rates.^{12, 14, 15, 16}

3. Appropriate Insertion Intervention

This section is coming soon.

4. Care and Removal Intervention

More than 14 studies have evaluated the effectiveness of urinary catheter reminders and stoporders, including written, computerized, and nurse-initiated stop-orders in reducing infections. The evidence indicates that reminders and stop-orders result in significant reduction in catheter use and significant reduction in infection, and there is no evidence of harm, such as a need for re-insertion.¹¹ In addition, nursing workload has been cited as a significant issue because urinary catheters can ease nursing workflows, and there may be a perceived disincentive for removal.¹¹ This Care and Removal Intervention includes education for staff on appropriate indications and ways to avoid urinary catheter placement, implements a process to evaluate urinary catheter utilization and compliance with appropriate indications, and promotes sustained improvements

St. John Hospital and Medical Center in Michigan used a process to evaluate the need for indwelling urinary catheters and reduced unnecessary urinary catheter use by 45 percent. This work was expanded to participating units from approximately 70 Michigan hospitals enrolled in the *MHA Keystone: Hospital-Associated Infection* prevention project, which has shown and sustained a 25 percent reduction of all catheter use (unpublished data) over a period of 18 menths.

through daily evaluation of catheter appropriateness and prompt removal when a catheter is no longer needed.

The key elements of the Care and Removal Intervention may be summarized as follows:

- 1. Assure the catheter is indicated based on the 2009 HICPAC/CDC Guidelines
- 2. Ensure appropriate care and maintenance
- 3. Remove catheters as soon as possible
- 4. Consider alternatives to indwelling urinary catheters

Education and Coaching Support

A key component to implementing this work is the efficient and effective dissemination of information to frontline staff and providers charged with changing processes to improve patient safety, care delivery, teamwork, and culture. The *On the CUSP: Stop CAUTI* project delivers educational content in a variety of formats, including conference call series, manuals and toolkits, and an in-person meeting. The project begins with an initiation call that prepares teams to participate in the project. Next are a series of content calls that discuss in further detail several components of the intervention. Call-in informational sessions on data collection and submission occur prior to the collection of baseline data. All calls include a question and answer component for interaction with the speakers. During the intervention period of the project, teams will participate in coaching calls. Coaching calls are completely interactive and structured according to the teams' needs. Toolkits, audio recordings and slides from calls, and other resources are available on the *On the CUSP: Stop HAI* web site for download.

Throughout the project, coaching and support are offered to the units at both a national and state level. The State Lead is available on coaching calls and serves as the key contact and call facilitator. State Leads are also available to answer ad hoc questions units may have regarding the project. A National Project Team (NPT) provides periodic support.

Additional resources are provided by the NPT and State Leads to help teams implement the intervention. Below is an abridged list of educational resources available to *On the CUSP: Stop CAUTI* teams via the project web site.

Resource Title	Resource Description
	These hour-long calls provide information regarding each main
Call Series	element of the program. Below is an example, and all call slides
	and recordings are available online.
Contont Call #2:	This hour long call reviews the steps to implement CAUTI
Content Call #5.	prevention. It provides information on unit selection, point
Later and Removal	prevalence, appropriate indications for indwelling urinary
Intervention	catheters.
Manuals and	These guides provide information to help you implement the On
	the CUSP: Stop CAUTI intervention in your unit. Below is an
	example, but all manuals and toolkits are available online.

 Table 2: Selected Resources Available on Project Web Site

Measures of Success

Complete and meaningful data justify the allocation of resources that are necessary to implement this work and demonstrate improvement over time. In addition, the collection and reporting of data are effective means of providing feedback to the teams and support improvement and sustainability. However, in most quality improvement projects up to 60 percent of data is missing.¹⁷ Missing data significantly damage the capacity to determine whether a given intervention has been successful. Yet, if the data burden of a project is too great, then teams struggle to collect and report it. For this reason, this project has a narrow set of measures that are collected and reported on a schedule that attempts to provide relevant feedback while reducing the data collection burden. The timing of the data collection is closely linked to the timing of interventions allowing for real-time improvement. Three types of measurements will be collected:

- 1. Outcome Measures
 - a. CAUTI rates
- 2. Process Measures
 - a. Readiness Assessment
 - b. Prevalence and Appropriateness
- 3. Culture Measures
 - a. Hospital Survey on Patient Safety Culture (HSOPS) at baseline and again near the end of the project
 - b. Team Check-up Tool (TCT)

The data definitions and collection processes are explained in more detail in section seven of this manual.

Project Infrastructure

National Project Team
The National Project Team to implement this patient safety improvement effort consists of nine organizations that each contribute unique knowledge and experience to support the improvement effort and to build program capacity at the national, state, hospital, and hospital unit levels. The following is a brief description of each individual organization's role within this project:

- The Health Research & Educational Trust (HRET) administers the project and provides oversight of the national implementation effort. This includes budget and project management, state recruitment, and support for implementation. HRET assists with coordination of meetings, educational conference calls, and web site maintenance. Beyond the initial project period, HRET is also responsible for helping states sustain and spread their success by disseminating the lessons learned in this national effort.
- The Michigan Health & Hospital Association Keystone Center for Patient Safety & Quality (MHA Keystone) contributes to the development and coordination of the project's education and coaching. MHA Keystone is responsible for data collection and reporting, as well as supporting content and coaching calls. They address clinical interventions, data use, submission, and reporting issues and provide project implementation advice.
- The Johns Hopkins University Quality and Safety Research Group (JHU QSRG) reviews the CUSP content adapted by HRET for this project and provides related tools. JHU QSRG faculty support national CUSP calls and consult with HRET and MHA on emerging content specific to CUSP. JHU QSRG also serves as faculty for the initial CUSP educational sessions.
- The University of Michigan is a national leader in CAUTI prevention research. University of Michigan faculty serve on the NPT as CAUTI prevention content experts.
- St. John Hospital and Medical Center demonstrated the effectiveness of the CAUTI prevention techniques used by the *On the CUSP: Stop CAUTI* through their early implementation of CAUTI reduction interventions. A member of the St. John faculty serves on the NPT as a CAUTI prevention content expert.
- The Centers for Disease Control and Prevention (CDC) provide technical assistance to state health departments to assist in the creation of sustainable state infrastructures for HAI prevention as part of a larger HAI Action Plan. CDC definitions are used as the standard in *On the CUSP: Stop CAUTI*.
- The Association for Professionals in Infection Control (APIC) provides guidelines for infection control that are used in *On the CUSP: Stop CAUTI*.

- The Society for Hospital Medicine (SHM) has created a mentoring program to link health workers in hospitals for professional growth and learning. *On the CUSP: Stop CAUTI* will work with this program to help facilitate learning.
- The Society for Healthcare Epidemiology of America (SHEA) provides extended faculty support to help facilitate learning and training of units.

State Collaborative

State hospital associations (SHA) play a key role in the implementation of the *On the CUSP: Stop CAUTI* intervention. SHAs act as liaisons between the NPT and hospitals within their respective states. The State Lead at each SHA serves as a local content advisor and coach to teams.

Depending on your state, your SHA may coordinate with your state health departments, quality improvement organizations, or other quality and patient safety organizations. While the roles of these groups vary among individual states, their partnership aids in the implementation of the program as they help to recruit hospitals, market the importance and practicality of the program, and maintain program data.

Hospital Teams

Embodying the front line role, individual hospital unit teams collect program data and implement the CUSP guidelines to ensure a complete implementation of the *On the CUSP: Stop CAUTI* program. Each step equips the frontline providers of all hospital units with the tools, metrics, and framework to tackle the challenge of quality improvement and CAUTI prevention. Through applying the *On the CUSP: Stop CAUTI* tools, metrics, and framework on the front lines, hospital unit teams play an important role in the project's success. Units participating in the project include medical-surgical units, intensive care units, labor and delivery, emergency department, pediatrics, radiology, and any other unit with high UTI rates.

Graphic 1: Project Infrastructure



AHRQ funds this and other HAI initiatives. AHRQ's mission is to improve the quality, safety, efficiency, and effectiveness of health care for all Americans. The research sponsored, conducted, and disseminated by AHRQ provides information that helps people make better decisions about health care. For more information about AHRQ, visit <u>http://www.ahrq.gov</u>.

Models and Frameworks for Change and Improvement

The 4 E's Model

The JHU QSRG developed the 4 E's model to help implement patient safety interventions.¹³ This model includes four stages that answer the following questions:

- **1. Engage**: How will this make the world a better place?
- 2. Educate: How will we accomplish this?
- 3. Execute: What do we need to do?
- 4. Evaluate: How will we know we made a difference?

Engage: How does this make the world a better place?

The first E focuses on *engagement*. This is the step where you help your entire organization to understand the significance of reducing CAUTI. Project leaders talk to senior leaders, team leaders, and bedside staff about the prevalence of catheter use, the risk to patients, and the health care costs associated with CAUTIs. To engage your colleagues, first make the problem real by telling the story of a patient who developed a CAUTI in your clinical area or hospital. Identify a patient in your clinical area who has suffered needless harm from a catheter, and share the patient's story with your colleagues. Work with risk management at your hospital to share this story openly with your colleagues and leadership. Know facts about your project that will engage your unit:

- Millions of urinary catheters are placed each year in the United States, and urinary catheters are frequently used in the hospital setting. However, up to half of urinary catheter device days in the hospital setting may not have a valid indication for use.^{18, 19}
- Urinary catheter use has been associated with urinary tract infections and trauma.
- Approximately 600,000 patients develop hospital-acquired urinary tract infections per year. Around seventy-five percent of these episodes are CAUTIs.^{1, 2, 3, 4}
- Hospital-acquired bacteriuria or candiduria occurs in 25 percent of those patients who have urinary catheters in place for one week. The risk per day of bacteriuria is about 5 percent, and 3 percent of those with bacteriuria develop a bloodstream infection.^{1, 2}
- The longer the urinary catheter is used, the higher risk of infection.
- If the urinary catheter is not present, CAUTI does not occur.
- The cost of a hospital-acquired CAUTI averages between \$500 and \$1,000. Catheterrelated bacteremia increases the cost of care by at least \$2,800 per patient.^{1, 2}

After sharing the story of a patient who developed CAUTI, post the number of people who developed a CAUTI each month and the total number of CAUTIs for the previous year in your clinical area. To keep staff engaged, post a trend line so that nurses, physicians, and other staff can see at a glance your CAUTI rate and how it changes over time. Use formal and informal opportunities to talk about the intervention and about unit specific infection rates. Make a point of recognizing providers who follow guidelines for the appropriate use of urinary catheters. Invite your hospital infection control professional or epidemiologist to become an

active part of your clinical area's improvement team and draw on his or her expertise to help with your specific challenges. The goal should be that no patient suffers harm from a preventable complication while in your clinical area.

Educate: How will we accomplish this?

The second E, *educate*, is key to accomplishing your goal. Make sure your team understands how they can reduce CAUTIs and the use of inappropriate urinary catheters. There are several practices to prevent CAUTIs that should be included in any health care worker education. Importantly, clinicians should realize that CAUTI represents more than one-third of all health care-associated infections, and CAUTIs are associated with increased patient morbidity. Two key approaches to preventing CAUTI are to insert the indwelling urinary catheter only when needed (based on an appropriate indication), and remove it when it is no longer needed; and when an indwelling catheter is indicated, ensure that proper insertion technique is used during catheter placement, along with proper care and maintenance of the urinary catheter system once it is in place.

The general steps for education in the project are:

- 1. Educate staff on the CUSP model beginning with the *Science of Safety* video.
- 2. Educate staff about the appropriate indications using definitions by the Healthcare Infection Control Practices Advisory Committee (HICPAC) for use and proper care of urinary catheters. There are examples of presentations and educational materials provided in this manual in section six, <u>Table 5, CAUTI Tools</u>.
- 3. Educate staff who are collecting outcome data on the definition of CAUTI.
- 4. Participate in national and state conference and coaching calls.
- 5. Share the number of people infected per month and your quarterly infection rates with the unit, medical staff and the executive sponsor. If your team has low rates, it may be better to share the number of inappropriate catheters.
- 6. Learn from at least one defect per quarter, preferably one or more a month.

<u>Section eight</u>, includes detailed guidance for implementing the educational components of this project.

Execute: What do we need to do?

The third E focuses on how you will *execute* the program. Even well-conceived, successful programs can fail if they are poorly implemented. Taking time to carefully plan the execution can help reduce this risk.

Successfully implemented projects share some key characteristics. They are usually well structured, provide adequate support for participants, clearly outline roles and goals that are then clearly explained to stakeholders, and are adaptable to the unique needs of participants. At a unit level, take time to understand the importance of each step of the *On the CUSP: Stop CAUTI* intervention, and gain support to ensure a successful implementation.

To summarize, the general steps of executing this project are:

- Assemble a team, engage staff, and partner with a senior executive.
- Understand the CAUTI interventions. Listen to the content calls and read through the materials provided by the NPT.
- Understand Safety Culture and how to apply CUSP to daily routine. Materials are available in this manual and on the *On the CUSP: Stop HAI* web site.
- Understand the issues with inappropriate catheter use and risks.
- Understand measures, and establish processes to ensure data is collected. Participate in data calls, and work with your team to put processes in place.
- Use teamwork tools that are relevant to the unit. Tools are available online and in the appendices of this manual.

If implementation does not go as planned, treat it like any other defect, learn from it, and then improve your execution. <u>Section eight</u>, includes detailed guidance for executing this project.

Evaluate: How will we know we made a difference?

The fourth E focuses on the *evaluation* process. In this step, you reflect on data that has been collected in order to determine the success and where improvements should be made.

Data are collected on culture, process, and outcome measures. Reports are available in Care Counts so that states and units may have continuous access to their data in order to monitor progress over time. These reports can be generated at the unit level and at a higher aggregate level. These reports should be used to evaluate progress on improving urinary catheter utilization, compliance with indications, and CAUTI reduction by sharing them with the safety team, senior executive partner, and unit staff/providers.

In addition to evaluating progress on CAUTI, your unit team will be asked to complete a "Team Check-up Tool" (TCT) on a quarterly basis. This tool asks about the activities the team has implemented in regard to CUSP and culture change, as well as the barriers the team has faced. The TCT is a mechanism for teams to identify what is impeding progress, a way to measure barriers to progress, and an ongoing means to see whether improvements are being made. The information from the TCT for your unit should be summarized and reported to the team and the executive partner every quarter. This will provide a channel for the safety team to report issues to management in a way that allows honesty and openness, which in turn may help the executive provide the team with assistance and solutions.

Measure Type	Reports Available
	HSOPS
Culture	Team Check-up Tool
	Readiness Assessment
	Percent of Patients with a Catheter (Prevalence Rate: number of patients with catheters/total number of patients x100)
Process	Data Submission Status
	Appropriate/Inappropriate Catheter Indication Rates

Table 3: Measure Type: Reports Available Table

	Symptomatic CAUTI rates:		
	 Number of symptomatic CAUTIs/number of catheter days x 1,000 		
Outcome	 Number of symptomatic CAUTIs/number of patient days x 10,000 		
	Data Collection Status		
	Prevalence Rate (catheter days/patient days)		

Comprehensive Unit-based Safety Program

Overview of the CUSP Model

The CUSP model is designed to equip frontline unit staff with a framework and tools to improve patient care and make your unit safer. For this project, CUSP will serve as a model that will help your unit staff to understand the risks of CAUTI associated with non-compliance with appropriate use and care of the catheter, and the role and shared responsibility of every unit staff member to help change your unit's work processes to reduce the risk of those infections for patients in your care. Culture is a major focus because it represents a set of shared attitudes, values, goals, practices, and behaviors that make one unit distinct from another unit. The CUSP framework is comprised of five components, each described in more detail in this section.

CUSP Components and Implementation Guidance

Understand the Science of Safety

When a mistake occurs, we too often assume that the error was the result of inexperience, a lack of supervision, or simply bad luck. However, the fact is that care is often delivered within poor systems or in the absence of systems altogether. The Science of Safety provides a conceptual framework and a common safety vocabulary that allows frontline providers to recognize, raise, and address safety defects at the system level. The goal of the Science of Safety training is to inform all frontline providers and executive partners about the magnitude of the patient safety problem, provide a foundation for investigating safety defects from a systems perspective, and highlight how each staff member's involvement can make a significant difference to make care safer, particularly in regard to reducing the risk of CAUTI. A system is a set of parts interacting to achieve a goal, and the Science of Safety training emphasizes how each part or cog in the health care system contributes to the provision of care and is vital to bringing about sustainable change in the clinical setting.

This step will help your unit staff to:

- Understand that safety is a system property
- Understand the basic principles of safe system design, including standardizing work, creating independent checks (checklists) for key processes, and learning from mistakes
- Recognize that the principles of safe design apply to technical as well as team work, and understand that teams make wise decisions when there is diverse and independent input

TIP: As John Kotter recognizes, leading change requires a sense of urgency. The tragic death of Josie King brought this sense of urgency to Johns Hopkins. For another organization to relate and feel the same sense of urgency, they should focus on a safety event that occurred in their own organization. Revealing such an event may be difficult. Having a nurse manager or someone in a leadership capacity start a conversation about a safety event may help others to

The Science of Safety training includes two companion pieces. First, have your staff view the 32minute *Science of Safety* "Improving Safety" presentation by Dr. Peter Pronovost. Next, ask your staff to read the transcript of Sorrel King's speech at the 2002 Institute for Healthcare Improvement (IHI) Conference. Her speech retells the tragic death of her 18-month old daughter, Josie, from a series of errors. Both Dr. Pronovost's "Improving Safety" presentation and Sorrel King's speech are available from the *On the CUSP: Stop CAUTI* web site on the <u>Stop</u> <u>CAUTI "Manuals and Toolkits" page</u>.

What the team needs to do:

The CUSP team leader or nurse manager should ensure that all staff members watch the *Science of Safety* presentation within the first month of CUSP implementation. This can be challenging, and there is no one right way to accomplish this goal. One popular approach is to schedule large group training sessions. However, a smaller group or individual training can be used as well. For an example of how to track the completion of staff member training, see the Science of Safety Training Attendance Sheet (Appendix A). You should share the video with your medical staff and house officers by screening the video at medical staff meetings and house staff educational sessions, which are already scheduled, rather than expecting physicians to attend a separate meeting.

Staff members should discuss safety events on their unit, what systems may have led to

the events, how the principles of safe design could be applied to improve safety, and how teams can improve communication. Also, be sure to work with administration to ensure that new frontline providers, who join the unit later, watch the *Science of Safety* video. One strategy is to include these presentations in

After watching the "Science of Safety" video, staff members should be encouraged to discuss the important concepts they have learned, and how they might apply it to the CAUTI project.

the standardized orientation programs for new staff, agency staff, and new house officers and medical staff.

• The National Project Team recommends that the Staff Safety Assessment Form (Appendix B), introduced in the next section, be handed out at the end of the Science of Safety training session. This is also a good time to instruct staff regarding how to report safety concerns on the unit in the future, identify the executive partnering with the unit, and describe how Executive Safety Rounds will be conducted.

Assemble the Team

When you assemble your team, remember that culture is local. The *On the CUSP: Stop CAUTI* team is composed of engaged frontline providers who take ownership of patient safety. You should include providers of different types and levels of experience on your team. Partner with nursing, Assemble the Team through:

- Understanding the importance of a CUSP team
- Developing a strategy to build a multidisciplinary team
- Identifying characteristic of successful teams and barriers to team performance

case management, infection prevention, and physicians. Recruiting the right personnel for a unit-based multidisciplinary team is crucial, because the team will:

- Oversee the process to guide the implementation and management of the program
- Be the driving force for sustaining the program

As you develop your *On the CUSP: Stop CAUTI* team, you should ensure that the team possesses four key characteristics of successful teams. They include:

- An identified team leader
- Diverse opinion leaders or dissenters
- Members with a willingness to help spread the intervention
- A majority of members who provide direct care in the unit

These characteristics will help ensure that you have a successful team. Barriers to performance can occur when you do not have all four key characteristics, when there is miscommunication among team members, or when there are competing priorities for team members. Working to reduce these barriers contributes to team success.

What the team needs to do:

- Recruit a team lead, nurse manager, physician, and executive partner along with any other team members. Having a team leader who is a member of the patient care unit maximizes ownership of the project.
- The team leaders should meet with hospital risk management, quality improvement, and infection prevention departments to ensure that CUSP efforts are integrated into overall hospital quality improvement and patient safety efforts. Staff from these departments are knowledgeable about existing data collection efforts and have expertise in areas that will be useful to the *On the CUSP: Stop CAUTI* team.
- List team member names and contact information on the Background Quality Improvement Form (Appendix C) and post this list in a visible location for staff reference. Perhaps entertain the idea of an open invitation to join the team at a staff meeting or through another method of communication that will reach the entire staff that work with patients in your area, including members from pharmacy, nutrition, and occupational or physical therapy.

• Use the 4 E's to ensure team engagement. Team members need to know what is in it for them. Engage them in the process. Educate them about their roles. Work with your team to execute the processes. Then evaluate what you have done.

Implement Teamwork and Communication

The National Project Team has developed a series of practical tools to help teams improve communication and teamwork and address areas that may present hazards to safety on your unit. <u>Table 4</u>, provided below, highlights specific tools and their purpose within the

Implement Teamwork and Communication: This step helps your unit learn and use specific tools that will help to improve teamwork, work processes, and

CUSP program. Copies of each tool are available in the appendices of this manual. Some of these tools are mentioned in this guide, and others will be discussed during the course of calls.

Name of Tool	Purpose	Appendix
Science of Safety Training Attendance Sheet	Verify participation in screenings of the <i>Science of Safety</i> educational video.	А
Staff Safety Assessment	Inventory threats to patient safety identified by frontline care providers.	В
Background Quality Improvement Form (Team List)	Gather names, titles, and contact information for unit safety improvement teams.	С
Learning From Defects	Set up a local process to learn from and respond to defects locally, within the unit.	D
Case Summary Form	Analyze a case example of patient harm or a near-miss to identify system factors and opportunities for improvement.	E
Daily Goals Checklist	Improve team communication regarding patient's plan of care.	F
Morning Briefing	Get everyone on the same page at the beginning of a day or shift, so that expectations are set and the day is more predictable	G
Shadowing Another Profession	Identify and improve communication, collaboration, and teamwork skills between	Н

Table 4: Tool List

Name of Tool	Purpose	Appendix	
	different practice domains.		
	Identify safety issues and recommendations		
Safety Issues in the Executive	for improvement identified by frontline staff in	Ι	
Partnership	conversation with a senior executive.		
	Track previously identified safety issues and		
Status of Safety Issues	recommendations for improvement and status	J	
	of improvement efforts.		
Culture Debriefing Tool	Provide a structured process to make culture	V	
	results actionable.	N	

What the team needs to do:

Identify opportunities to improve teamwork and communication by reviewing the unit scores from the baseline safety culture assessment (the Hospital Survey on Patient Safety Culture, or HSOPS), and any barriers that the team identified while learning from a safety defect. Examples of this include poor teamwork climate, or nurses' fear to discuss catheter removal with physicians. Discuss with frontline providers how and where they want to improve communication, and select a tool that best addresses their concerns. Incorporate teamwork and communication tools into your team meetings and other project processes.

Identify and Learn from Defects

Frontline providers are the eyes and ears of patient safety. They possess the expertise and knowledge needed to improve safety. After being exposed to the Science of Safety, frontline providers are more aware of system level defects and are prepared to identify clinical or operational issues or defects, which may have the potential to affect patient safety. The NPT has found that one of the strongest determinants of safety culture is whether physician and nurse managers listen to and act on staff concerns regarding patient safety. Therefore, it is important to follow through once staff identify defects. Identify and Learn from Defects: This step asks your staff to think about how the next patient on your unit may be harmed, particularly in regard to inappropriate urinary catheter use as well as introducing a structured process to learn from medical and other errors by examining: what happened; why it happened; what you did to reduce risk; and how you measure whether risks were actually reduced. There are many sources to identify safety defects. Once defects are identified and prioritized, frontline providers can learn from them and implement improvement efforts. The Learning from Defects form (Appendix D) will help frontline providers investigate safety defects by examining one defect, identifying the factors that contributed to that defect, implementing and measuring changes to reduce the probability of the defect recurring, and summarizing what was learned from this investigation. The Learning from Defects (LFD) process seeks to answer four questions:

- 1) What happened?
- 2) Why did it happen?
- 3) What can you do to reduce risk?
- 4) How do you know risks were reduced?

The National Project Team asks that the safety team learn from at least one defect per quarter, preferably at least one per month. This defect can be a safety issue that is either related or unrelated to CAUTI. The process of learning from defects yields useful knowledge that can often be applied to various patient safety issues such as falls, medication errors, and handoffs in care. Because staff and physicians see CAUTIs all the time and view them as inevitable yet treatable, it is important to emphasize to staff that CAUTIs are painful for patients and often seed additional infection in the patient. Because of this, it is imperative that health care providers devote additional time and energy to education aimed at eliminating CAUTI. To encourage discussion and education on the topic, one may want to open a discussion about a recent CAUTI on the unit, or a general review of the current CAUTI rates. The discussion and following education steps are vital to the CAUTI project as they play an important role in staff education as they invite staff members to share factors they have observed on the unit that may be contributing to CAUTIs. To be encouraged to begin this step, staff and providers may:

- Complete the Staff Safety Assessment Form (Appendix B), which asks providers how the next patient will be harmed in their unit and what they think can be done to minimize patient harm or prevent this safety hazard from happening again
- Review other potential sources of information about defects, including your hospital's incident reporting system, risk management reports, liability claims, and morbidity and mortality conferences

Tap into frontline providers' tremendous knowledge about risks to patient safety. Incorporate the LFD process into activities undertaken with your senior executive. This includes completing the Case Summary Form (Appendix E) that is part of the LFD tool and sharing the learning both inside and outside the unit. The senior leader may want to encourage this type of sharing by asking, "Did you share your lesson learned recently through the Defects tool, and if so, with

who?" Some additional examples include: a communication book that is read and signed by all frontline providers, a dedicated bulletin board, or updates at routine staff meetings. In the Michigan experience, some units produced newsletters to share what was learned on the participating unit with others in the hospital. While these are examples, any form of dissemination that works for your individual unit is encouraged. It is important to share the LFD case summaries throughout your health system as events tend to be common among units.

What the team needs to do:

The CUSP team leader, or his or her designee, should distribute the Staff Safety Assessment form to all clinical and nonclinical providers in the unit. One person should be assigned the task of handing out and collecting the safety assessment forms. To encourage staff to report safety concerns, establishing a collection box or envelope where completed forms can be dropped off anonymously may increase staff participation. All safety assessments should be:

- Grouped by common types of defects (such as communication, medication process, patient falls, supplies, etc.)
- Prioritized considering the following criteria: likelihood of harming the patient, severity of harm, how common it is, and likelihood that it can be defended against in daily work
- Shared with your senior executive partner. Note that one of the tasks of the senior executive is to help prioritize the unit's safety concerns. You have the option of saving this prioritizing process for your meeting with your executive partner. You can use informal methods (for example, group consensus) or formal quantitative methods to prioritize the greatest risks (for example, rating risk of harm). It is important to understand that identifying and learning from defects is not a one-time event, but rather a continuous process. As your team identifies safety issues and implements interventions to make improvements, conduct new safety assessments to identify other defects. Take one defect identified on your unit such as a CAUTI, an incident report, sentinel event, liability claim, or defect identified from the Staff Safety Assessment, and complete the LFD tool. Each unit should complete at least one LFD tool and the accompanying Case Summary form (Appendix E) per quarter.

While organizations have other modes of learning about risk, such as failure modes and effects analysis (FMEA) or root cause analysis (RCA), these are burdensome and infrequent. The LFD process enriches FMEA and RCA by encouraging greater involvement of frontline staff, through a built-in process and accountability structure for implementing system changes as a result of input from staff, and a strong focus on the patient as the center of process changes. To manage

and track safety activities, it may be easiest to transfer this information to the Status of Safety Issues form (Appendix J).

Engage the Senior Executive

Partnering a senior executive with your unit has two goals: to bridge the gap between senior management and frontline providers, and to allow for a system level perspective. The senior executive's role is one of advocacy. The senior executive should be encouraged to discuss the safety issues identified by the team and frontline care providers and to help remove barriers (e.g., lack of resources, political issues, lack of awareness) to implementing improvement efforts. In addition, the executive's role is also to stimulate further discussions about safety, help prioritize safety concerns, suggest solutions to safety concerns, and help set goals for the unit.

Engage the Senior Executive: This step invites a senior hospital executive to partner with your unit in order to:

- Educate leaders about the clinical issues and safety hazards
- Provide staff with resources to mitigate hazards and assist with removal of barriers
- Improve frontline providers' attitudes about leadership
- Help to hold staff accountable for reducing patient risks and open

Additionally, the executive should hold everyone, including providers and him or herself, accountable for undertaking efforts to reduce risks to patients.

The effect that the patient safety team and frontline providers can have on the executive is important. The executive can gain tremendous knowledge by observing and understanding the challenges the units face each day on the frontline. In addition, executives may not be aware that system defects exist in their hospital.²⁰ These valuable insights often alter the way the executives do their jobs, and they frequently report that their hour on the unit is time they look forward to the most each month.

One of the most effective approaches to bridging the gap between senior management and frontline providers is to conduct executive safety rounds, where the executive mingles with providers on the unit while discussing safety issues. Meeting with providers in a conference room format should be kept to a minimum. Meeting with providers on the unit is vastly preferable to meeting in a conference room, as presence on the unit helps to give senior leaders a greater sense of ownership of the project and a sense of being an integral part of the unit team. Meeting on the patient care unit also allows senior executives to be more visible to frontline staff and imparts a stronger sense of commitment to the project.

What the team needs to do:

- The CUSP team leader or members of the safety team should meet with the senior executive assigned to their unit to share unit-specific information before the executive holds safety rounds. To prepare for this meeting, gather relevant information about the unit for the senior executive. This information packet should include:
 - o Background information about the CAUTI project
 - Results from the safety culture baseline assessment if available
 - A list of safety issues that have been identified for that unit, such as those that may have been compiled from the staff safety assessment
 - Pertinent information about the unit that the senior executive may not know, especially information in regard to CAUTIs for that unit, and patient/physician demographics. If your senior executive does not have a clinical background, you may want to suggest that he or she visit the unit before the first staff meeting to get a better feel for the unit and how it works. He or she may also want to consider shadowing a provider to observe where system breakdowns are occurring within the unit. The Shadowing another Profession activity (Appendix H) will be helpful for this.
 - You may also want to provide your unit executive with a concise dashboard about the status of quality and safety culture on your unit. Some suggested sources of data in addition to the safety culture assessment results include sentinel events, incident reports, and liability claims. In the Michigan experience, a patient safety dashboard was used that included four items: how often patients are harmed (infections), how often they get the right care (appropriate care), how often are teams learning from defects and is culture improving.

The unit champion or other member of the safety team should then work with your executive sponsor to schedule monthly executive safety rounds and post this schedule on a bulletin board that is accessible to unit providers. The unit team should invite all providers to attend these rounds. If possible, post a picture of the unit's senior executive partner and his or her contact information on the unit. This will help increase visibility of the executive and the program as well as help providers to feel comfortable addressing and contacting the executive.

- In preparation for executive safety rounds, the unit champion should brief providers
 regarding the purpose of partnering with a senior executive and ask them to be
 prepared to discuss their own safety concerns and suggestions for resolution during
 rounds. Make sure to repeat this preparatory step a few days before each safety round
 as a reminder to frontline providers and to collect any safety concerns from providers
 who will not be physically present on the day of rounds.
- During executive safety rounds, the patient safety team, senior executive, and unit providers should review any safety issues identified, particularly those related to CAUTI, and list them on a tracking log. An example of this log, the Safety Issues Worksheet for Senior Executive Partnership, is provided as Appendix I in this manual. You may want to start with one or two safety issues that do not require extensive resources to implement and up to two issues that need additional resources (require funds to implement) and note these on the form. Documenting safety issues that will be addressed based on the executive safety rounds is useful in tracking the impact of the initiative. It may be helpful to transfer the safety issues that you are working on to the Status of Safety Issues form that is provided as Appendix J in this manual. Then, the executive partner and unit members can assign a contact person to champion all activities associated with each issue. As patient safety issues are resolved, they can be moved to the "Completed" section on the bottom half of the Status of Safety Issues form. Return this form to your unit champion so frontline providers on your unit can be kept informed about the progress of improvement interventions. Posting this form in a highly visible location where staff will see it regularly is a great way to increase staff awareness and encourage engagement.
- Part of patient safety rounds should include a discussion about the investigation of a safety defect identified using the Staff Safety Assessment (Appendix B). It may be best to wait until the second session with your senior executive before incorporating this tool in safety rounds. Waiting will provide an opportunity for your team and unit to undertake a trial run to see how the tool works so you are better able to explain the investigation process to your executive partner. This investigation process includes frontline staff and the executive using the Learning from Defects tool (Appendix D) to identify what systems-based safety problems contributed to the defect. This process will include a plan of action to resolve system defects that is documented on the Learning from Defects tool. Again, this is an ideal time to use your CUSP tools to address a safety issue related to CAUTI.

Interventions to Prevent CAUTI

There is clinical evidence that provides guidance in CAUTI prevention. Prevention efforts focus on proper catheter insertion practices, care and removal of catheters, and reduction in use of indwelling urinary catheter use.

Appropriate Insertion Intervention

This section is coming soon.

Care and Removal Intervention

The key elements of the Care and Removal Intervention may be summarized as follows:

- 1. Ensure the catheter is indicated based on the guidelines set forth by the Healthcare Infection Control Practices Advisory Committee and the Centers for Disease Control and Prevention (HICPAC/CDC). The evidence-based HICPAC/CDC Guidelines specify seven indications for urinary catheters.
- 2. Ensure appropriate care and maintenance. Ensure use of aseptic insertion, proper maintenance, hand hygiene, education, and feedback.
- 3. Remove catheters as soon as possible. Patients should be monitored daily for catheter use.
- 4. Consider other alternatives to indwelling urinary catheters. There are alternatives to catheter use, and use of bladder scans can determine whether a catheter is required.

Step 1: Ensure the catheter is indicated based on the HICPAC/CDC Guidelines

In 2009, HICPAC and the CDC reviewed and revised appropriateness guidelines for the placement of urinary catheters. The consensus-based guidelines were published in a report and included both appropriate and inappropriate indications. As the guidelines are consensus-based, there may be instances where there are local indications that are not addressed within the indications below. With this in mind a participating hospital may, through a reasonable and thoughtful process, develop a small listing of hospital-approved indications. The data collection process allows for these to be accounted for as appropriate indications.

Appropriate indications for urinary catheterization based on HICPAC guidelines are as follows:

- 1. <u>Acute urinary retention or obstruction</u>—In the event of urinary retention or obstruction, urinary catheters are indicated. Examples of outflow obstruction would include prostatic hypertrophy with obstruction, urethral obstruction related to severe edema, and urinary blood clots with obstruction. Acute urinary retention may be medication induced, medical (neurogenic bladder), or related to trauma to the spinal cord.
- 2. <u>Perioperative use in selected surgeries</u>—Urinary catheters are indicated in the event of certain surgeries. When a surgery is expected to be prolonged, when a patient will undergo large volume infusions during surgery, or when there is a need for intraoperative urinary output monitoring, catheters should be used. Catheters are also indicated for urologic surgeries or other surgeries on contiguous structures of the genitourinary tract. In addition, spinal or epidural anesthesia may lead to urinary retention, which would require a catheter. However, prompt discontinuation of this type of anesthesia should prevent the need for urinary catheter placement.
- 3. <u>To assist healing of perineal and sacral wounds in incontinent patients</u>—This is an indication for urinary catheter use when there is concern that urinary incontinence is leading to worsening skin integrity in areas where there is skin breakdown.
- 4. <u>Hospice/comfort/palliative care</u>—This is an acceptable indication for catheter use in endof-life care, if it helps with patient comfort.
- 5. <u>Required immobilization for trauma or surgery</u>—Urinary catheters may be used when trauma or surgery requires immobilization. These cases include instability in the thoracic or lumbar spine, multiple traumatic injuries, such as pelvic fractures, and acute hip fracture when there is risk of displacement with movement.
- 6. <u>Chronic indwelling urinary catheter on admission</u>—Patients with a chronic indwelling catheter on admission are included as having an acceptable indication for use (this indication is not listed as one of the HICPAC indications).
- 7. <u>Accurate measurement of urinary output in critically ill patients</u>—Catheters are indicated when accurate measurement of urinary output is required. This applies to patients in the intensive care setting.

Inappropriate indications for urinary catheterization are as follows:

- <u>Urine output monitoring outside the ICU</u>—Monitoring of urine output in patients with congestive heart failure receiving diuretics is not an indication for urinary catheter placement. Some potential solutions are use of urinals for men and hats for women (to monitor output), and accurate daily weights. For patients with congestive heart failure, consider involving the patients themselves. Consider providing patients with information instructing how to document their output and daily weights. Providing pamphlets may be helpful. Informational materials will also help patients learn to accurately measure their output.
- 2. <u>Incontinence without a sacral or perinea pressure sore</u>—Incontinence should not be a reason for urinary catheter placement. Patients admitted from home or from extended care facilities with incontinence managed their incontinence without problems prior to admission. Mechanisms to keep the skin intact need to be in place. Avoid urinary catheter placement in these patients. Some potential solutions in the event of incontinence include use of skin barrier creams for protection, use of a bedpan, or assisting the patient up to the commode regularly. Check for any wet bed linen, and change linens if they are wet when the patient is being turned in bed.
- 3. <u>Prolonged post-operative use</u>—Any urinary catheter should be promptly discontinued (within 24 hours of surgery) unless other indications are present.

4. Other inappropriate uses:

- a. <u>Patients who have been transferred from intensive care to a floor</u>—A urinary catheter should be discontinued promptly after the patient has been transferred from the ICU to a floor.
- b. <u>Morbid obesity or immobility</u>—Morbid obesity or immobility should not be a trigger for urinary catheter placement. Patients who are morbidly obese have functioned without a urinary catheter prior to admission. The combination of immobility and morbid obesity may lead to inappropriate urinary catheter use. However, this may lead to more immobility with the urinary catheter being a "one-point restraint." Some potential solutions include toilet training every two hours, use of a bedpan or urinal, or assisting the patient out of bed.
- c. <u>Confusion or dementia</u>—Patients with confusion or dementia should not have a urinary catheter placed unless one of the seven indications for placement described above are present.

d. <u>Patient request</u>—Patient request should not be a reason for placement of unnecessary urinary catheters. Explain to the patient the risk of infection, trauma, and immobility related to the use of the urinary catheter. The only exception would be for patients who are receiving end-of-life or palliative care (indication #4 described above). For example, if a patient is on diuretics and does not want to move out of bed multiple times, a catheter should not be used. Education is key! Explain to the patient the increased risks associated with use of a urinary catheter: urine infection, skin breakdown, and deep venous thrombosis due to immobility.

What the team needs to do:

Ensure that unit teams and care providers are properly educated in the seven indications for urinary catheters and the four non-indications outlined above. Several educational tools are available in the appendices of this manual and at http://www.onthecuspstophai.org/stop-cauti/manuals-and-toolkits/, including two posters on urinary catheters, a brochure, fact sheet, and pocket card, which all outline the seven indications for catheter use.

Step 2: Ensure appropriate care and maintenance

Insertion and Maintenance of Urinary Catheters

Gloves should always be used when manipulating the catheter site and drainage system, and hand hygiene should be practiced before and after the procedure. A sterile, continuously closed drainage system should be maintained for indwelling catheter systems. The catheter and drainage tubing should not be disconnected unless the catheter can only be irrigated manually or if new tubing needs to be attached.

Maintenance of Urinary Catheters

- If there are breaks in aseptic technique, disconnection of tubing, or leakage from the bag, replace the drainage system. Disinfect the catheter-tubing junction before connecting to the new drainage system. If the catheter becomes contaminated, replace the catheter.
- Make sure urinary flow is not obstructed. Ensure the catheter is not kinked. Drainage bags should always be placed below the level of the patient's bladder to facilitate drainage and to prevent stasis of fluid. Urine in drainage bags should be emptied at

least once each shift using a container designated for that patient only. Care must be taken to keep the outlet valve from becoming contaminated. Use gloves and practice proper hand hygiene before and after handling the drainage device.

- Do not change urinary systems routinely. Consider changing the urinary system in the event of infection, obstruction, or a break or leak of the closed system.
- Do not disconnect the closed system. Avoid irrigation unless necessary (such as in the case of a catheter obstruction). The catheter tubing junction should be disinfected before irrigation. When sampling urine, disinfect the sampling port. Also check the site for possible disconnection of the catheter from the drainage bag.
- Frequently washing the meatus with povidone-iodine or soap is not associated with lower infection risk. In fact, aggressive cleaning may be associated with increased infection. Routine perineal hygiene during daily bathing is appropriate.
- Patients with urinary catheters will have intake and output (I&O) recorded. However, urinary catheters are not to be inserted for the sole purpose of monitoring output with the exception of patients in intensive care units. Make use of other means to monitor output in the incontinent patient, such as daily weights.
- Only nursing staff, family members, or patients themselves who know the correct technique of aseptic insertion and maintenance of the catheter should handle catheters. Health care workers and others who take care of catheters should be given periodic education and training, stressing the correct techniques and potential complications of urinary catheterization.

What the team needs to do:

Implement a urinary catheterization policy such as the one found in Appendix L and at http://www.onthecuspstophai.org/stop-cauti/manuals-and-toolkits/, which spells out care and maintenance guidelines in detail. The purpose of the policy is to standardize urinary catheterization to facilitate urinary drainage when medically necessary. Urinary catheters should be evaluated every day for need and removed promptly when they are no longer necessary.

Step 3: Remove catheters as soon as possible

Nurses and physicians should be aware of the indications for urinary catheter use and should continually monitor patient need for a catheter. Physicians should promptly discontinue

catheters that are no longer needed or indicated, and nurses evaluating catheters and finding no indication should contact the physician to promptly discontinue the catheter.

One prominent reason for inappropriate catheter use is a lack of awareness among clinicians of current catheter use. In a study published in 2000, 18 percent of medical students, 22 percent of interns, 28 percent of residents, and 35 percent of attending physicians were unaware that the patients for whom they were responsible had an indwelling catheter.²¹

What the team needs to do:

Daily monitoring of patient catheters is key. The Urinary Catheter Decision-Making Algorithm (Appendix M), Urinary Catheter Pocket Card (Appendix N), and Urinary Catheter Brochure (Appendix O), found at <u>http://www.onthecuspstophai.org/stop-cauti/manuals-and-toolkits/</u> all emphasize removal of catheters and can aid in reinforcing practices among teams.

Step 4: Consider alternatives to indwelling urinary catheters

There are several alternatives to using indwelling catheters, including bladder ultrasound, use of intermittent catheterization, and use of condom catheters.

- Bladder scanner: if available, may check if patient has urinary retention. This may avoid urinary catheter insertion or straight catheterization.
- Condom catheters: may be used for men with incontinence with risk of skin breakdown (e.g., pressure ulcers), or for accurate urine output monitoring in intensive care. Condom catheters cannot be used if the patient has urinary retention.

What the team needs to do:

Identify alternatives to indwelling urinary catheters that you plan to implement. An example of a Bladder Scan Policy is available in Appendix P and at <u>http://www.onthecuspstophai.org/stop-cauti/manuals-and-toolkits/</u> and can help your facility put this important method of reducing catheter use into practice.

Tools

A number of helpful tools to aid in implementing or expanding focused CAUTI prevention efforts can be found in the appendices and at <u>http://www.onthecuspstophai.org/stop-</u> <u>cauti/manuals-and-toolkits/</u>, under the heading "CAUTI Intervention Toolkit." These tools are listed below in <u>Table 5</u>: CAUTI Tools. Adaptation to the needs of your particular environment as needed is encouraged.

Table 5: CAUTI Tools

Name of Tool/Reference	Purpose	Appendix	
Policies			
Urinary Catheterization Policy	Apply evidence-based practice to reduce CAUTI	L	
Bladder Scan Policy	Apply evidence-based practice to reduce CAUTI	Р	
Printable Educational N	N aterials		
Urinary Catheter Poster (option 1)	Educate caregivers in: • Risks of catheter use • Indications • Non-indications	Q	
Urinary Catheter Poster (option 2)	Educate caregivers in indications for catheter use.	R	
Urinary Catheter Decision-Making Algorithm	Educate caregivers in catheter indications and the need for monitoring.	М	
Urinary Catheter Project Fact Sheet	 Educate caregivers in: The problem of CAUTI Project goals Indications Catheter removal 	S	
Urinary Catheter Pocket Card	Educate caregivers in: • Catheter removal • Risks of catheter use • Indications • Non-indications	N	
Urinary Catheter Brochure	 Educate caregivers in: Catheter removal Alternate solutions for incontinence The problem of CAUTI Catheter use algorithm Indications Non-indications 	0	

Table 5: CAUTI Tools (continued from previous page)

Name of Tool/Reference	Purpose	Appendix
Presentation Template	s	
Presentation to manager	 Educate nurse managers in: Project goals Project timeline Indications Non-indications 	W
Presentation to nursing staff	 Educate nurses in: Project goals Project implementation Indications Non-indications Helpful tips 	х
Presentation of data	Present CAUTI data in a compelling way to encourage project sustainability.	Υ
Implementation of Urinary Catheter Initiative	Encourage engagement in program implementation.	Z
Completion of staff education	Encourage engagement in program implementation.	AA
Unit rounds to begin	Encourage engagement in program implementation.	BB
Unit results	Encourage engagement in program implementation.	СС
Other Tools		
Skin Care in the Incontinent Patient		DD
Helpful Hints		EE

Measurement Culture, Process, and Outcome Measures

The collection and reporting of data is an effective means of providing feedback to teams and supports improvement and sustainability. There are two goals in data collection and measurement: changes in the culture of safety and appropriate catheter use. The overall goal of measurement is to determine the efficacy of each intervention.

To measure culture of safety, *On the CUSP: Stop CAUTI* employs AHRQ's Hospital Survey on Patient Safety Culture (HSOPS) to track changes in patient safety culture over time and to evaluate the impact of patient safety interventions. The survey is anonymous, with no individual staff identifiers. The survey will be administered twice during the project, once at baseline and again approximately 15 months later. *On the CUSP: Stop CAUTI* also uses a Readiness Assessment to determine the team's exposure to other interventions and their readiness to collect data. This assessment is completed by the Team Leader one time for the unit at the beginning of the project. Finally, a Team Check-up Tool is completed once per quarter by the team leader with input from the team to report on progress that has been made in the implementation of CUSP principles and barriers the team is facing.

There will be three periods of data collection and evaluation, during which both prevalence and appropriateness (process) data and CAUTI rates (outcome) data will be collected. The CDC National Healthcare Safety Network (NHSN) definitions are used for outcome data (Appendix U). The HICPAC guidelines for appropriate indications are used for process data (Appendix V). <u>Table 6</u> provided below details the culture, process, and outcome measures to be collected during *On the CUSP: Stop CAUTI*.

Table 6: Culture, Outcome, and Process Measures

DATA COLLECTED	DATA SOURCE	MEASUREMENTS
HSOPS (Culture)		

		15 domains:	
		1. Comm	unication Openness
		2. Feedba	ack and Communication About
		Error	
		3. Hando	offs and Transitions
		4. Teamv	vork Across Units
		5. Teamv	vork Within Units
Track changes in patient	MHA Care Counts	6. Manag	gement Support for Patient Safety
safety culture over time	Or commercial survey	7. Non-P	unitive Response to Error
and to evaluate the impact	vendors (e.g. Press	8. Superv	visor/Manager Expectations &
of patient safety	Ganey) in format	Action	S
interventions	specified by MHA	9. Promo	ting Patient Safety Staffing
		10. Organ	izational Learning & Continuous
		Improv	vement
		11. Freque	ency of Events Reported
		12. Numb	er of Events Reported
		13. Patient	t Safety Grade
		14. Overal	l Perceptions of Patient Safety
		15. Overal	l Summary

Table 6: Culture, Outcome, and Process Measures (continued from previous page)

DATA COLLECTED	DATA SOURCE	MEASUREMENTS	
Readiness Assessment			
Determine the team's exposure to other interventions and their readiness to collect data	Web-based survey	 5 domains: 1. Hospital Information 2. Description of Clinical Area 3. Safety Activities 4. Catheter Management Strategies 5. CAUTI Prevention Practices 	
Team Checkup Tool	1		
Identify what has been implemented and identify any impediments to progress	MHA Care Counts	 5 Elements Measure Adaptive Implementation Measure Technical Implementation Monitor Progress Behaviors Driving Performance Barriers to Teamwork and Communication 	
CAUTI Outcome Data			

 Indentify Number of Symptomatic CAUTIs attributable to your unit for the month Number of urinary catheter days per month (number of patients with urinary catheter device is collected daily at the same time each day, and the total is summed for the month) Number of patient days per month 	NHSN MHA Care Counts	 Symptomatic CAUTI rates: Number of symptomatic CAUTIs divided by number of catheter days, multiplied by 1,000 Number of symptomatic CAUTIs divided by number of patient days, multiplied by 10,000 Data Collection Status Prevalence Rate (catheter days divided by patient days)
Prevalence & Appropria	teness Process Data	
 Assess each patient on the unit for the presence of a urinary catheter Record the reason for the catheter 	MHA Care Counts	 Percent of Patients with a Catheter (Prevalence Rate: number of patients with catheters divided by total number of patients, multiplied by 100) Data Submission Status Appropriate/Inappropriate Catheter Indication Rates

Data Collection

Teams should collect and enter data by teams into the web-based portal <u>MHA Care Counts</u>. The periods of data collection and the measures to be collected are described below in <u>Table 7</u>.

Baseline data collection: Baseline refers to the period of time before staff members are formally educated about appropriate indications for urinary catheter use, and before instituting daily processes to evaluate the need for urinary catheters and to discontinue catheters that are no longer needed. Baseline data collection includes collection of prevalence and appropriateness (process) data and CAUTI rates (outcome) data.

Implementation period: Implementation refers to the period of time when staff education about appropriate indications for urinary catheters has been completed and a process has been

instituted to evaluate the need for urinary catheters. Implementation data collection includes collection of prevalence and appropriateness (process) data and CAUTI rates (outcome).

Sustainability period: Data collection on all elements listed above will continue on a less frequent basis.

TOOL/DATA COLLECTED	DATA COLLECTION SCHEDULE
HSOPS (Culture)	 Baseline Implementation: 15 months post baseline
Readiness Assessment	Baseline: One time per unit at start of project
Team Checkup Tool	Implementation: One tool completed each quarter
CAUTI Outcome Data	
 Number of symptomatic CAUTIs attributable to your unit for that month 	Baseline: Collect monthly for three months
 Number of urinary catheter days per month (the number of patients with urinary catheter devices is collected daily at the same time each day, and the total is summed for the month) Number of patient days per month 	 Implementation: Collect monthly for two months and quarterly thereafter Sustainability: Quarterly
	Baseline: Monday through Friday for three weeks
Prevalence and Appropriateness Process Data	• Implementation: Monday through Friday
 Assess each patient on the unit for the presence of a urinary catheter Record the reason for the catheter 	for two weeks, one day per week for six weeks, then one week (Monday through Friday) per quarter thereafter
	• Sustainability: one week (Monday through Friday) per quarter

Table 7: Data Collection Schedule*

* For dates specific to your Cohort, please consult your cohort-specific project calendar.

The data collection timeline correlates closely with project interventions, so it is imperative that feedback to teams and unit staff be given in real time to evaluate progress and modify processes as necessary.

Table 8: Data Collection References

Name of Tool/Reference	Purpose	Appendix
Data Collection Tools		
Prevalence & Appropriateness (Process) Data Collection Tool	The form helps units to collect prevalence and appropriateness data.	Т
References		
	Implement a surveillance process, including	
NHSN Definition for	use of an indwelling urinary catheter, a	11
Symptomatic CAUTI	positive urine culture, and the presence of	0
	certain clinical signs and symptoms.	
HICPAC Guidelines for	Continually assess patient need for urinary	M
Appropriate Indications	catheters.	V

Implementing On the CUSP: Stop CAUTI

This section of the toolkit provides an overview of project implementation activities, ongoing education, data collection and evaluation, and project milestones. In this section the technical portion of the project (CAUTI reduction interventions) and the adaptive portion (CUSP) are integrated into a single project management resource. This resource should be used as a quick guide to implementing the program on your unit. You can use the planning worksheets for each stage to keep track of due dates and necessary resources specific to your unit.

Phase 1: Start-up

Table 9: Start-up Phase Worksheet

Implementation Step	Resources	Due Date
Start-Up		
Participate in National Calls		
Download the Project Initiation Timeline		
Compile Project Manuals, Appendices, and Toolkits in		
to one resource binder		
<u>Select a Unit</u>		
Gain Buy-in from CEO, Team, and Staff		
Registration		

Start-up

Participate in National Calls

Participate in the Orientation Webinar. The Orientation Webinar is an introductory 60 minute webinar that will provide an overview of the collaborative. Teams are encouraged to attend this call to get a better understanding of participation requirements. PowerPoint slides will be distributed to the State Leads prior to the call and may also be accessed on the national *On the CUSP: Stop CAUTI* web site. If teams are not able to attend this webinar, they may also access the recording, which will be available on the web site.

Download the Project Initiation Timeline

Download the project initiation timeline. Project Initiation timelines are available for each cohort on the On the CUSP: *Stop HAI* web site. Download the timeline specific to your cohort so that you are aware of important dates.

Compile Project Manuals, Appendices, and Toolkits into one resource binder

Project manuals, appendices, and toolkits are available on the *On the CUSP: Stop HAI* web site. Download these files, and compile them into one resource binder so that all important documents are in a centralized location.

Select a Unit

Select a unit with at least moderate urinary catheter use as your target unit for this intervention. Evaluate units that have the highest urinary catheter utilization or units with increased nonindicated catheter utilization using point prevalence. Conduct a point prevalence to identify the unit with the highest usage of indwelling catheters, or work with your infection preventionist to determine the unit with the highest CAUTI rate. **Point Prevalence** is calculated using the following formula:

Example: During a nursing shift change, count all urinary catheters in use, and then count the number of patients on the unit. Using the formula above, use these counts to calculate point prevalence for multiple units. Identify the unit to target first. In the example below, you can see that the team should start with Unit B, because Unit B has the highest prevalence.

	Number of Urinary Catheters	Number of Patients	Prevalence
Unit A	6	32	19
Unit B	10	29	34
Unit C	4	30	13

Gain Buy-in from CEO, Team, and Staff

Alert staff on your unit to the start of the project. Share the link to the webinar recording with them along with the information you receive from State Leads. Encourage them to join the initiative. Meet with your CEO and unit leaders to discuss the initiative and its benefits for your units.

Registration

Your State Lead will send you a list of documents to be completed during this time period. These include:

- Registration- Registration is completed through an online form for Care Counts. The link to this form can be found on the website and will be sent to you by your State Lead.
- Data Use Explanation (DUE)-This form explains how we will use the data submitted by your hospitals. The DUE form should be signed by your hospital's CEO's or authorized representative and returned to HRET.

- CEO Commitment Letter-The commitment to participate in the project is formed between your hospital and the state hospital association. It should be signed by your hospital's CEO's or authorized representative and returned to HRET.
- Unit Team Commitment Form- Each member of the participating teams should sign this form on page 3. A copy of the signed form should be given to the State Lead.

Phase 2: Planning

Table 10: Planning Phase Worksheet

Implementation Step	Resources	Due Date		
Planning				
Assemble Your Team				
Develop Processes for Project Implementation				
Education				
Participate in National Calls				
Attend Learning Session # 1- Kickoff Meeting				
Educate Staff				
Develop Educational Plan				
Data				
Lay Foundation for Data Collection				

Planning

Assemble Your Team

• Establish your multidisciplinary team, and obtain leadership support from nursing, physicians, and administration.

Nursing: Identify a nurse leader to be the point person for your unit. Potential candidates include the nursing director, or a very effective nurse manager or charge nurse. This person will:

- o Explain the project to unit staff and the management team
- Ensure that unit staff are educated about CAUTI and the appropriate indications for urinary catheter use
- Facilitate use of teamwork tools to guide communications regarding the appropriateness of catheters and recommendations for removal of nonindicated urinary catheters
- o Support integration of CUSP into daily workflow and unit operations

Medical Staff: Identify a physician leader for the project on your unit. This could be an urologist, infectious disease specialist, hospitalist, quality/patient safety officer, or any physician with an interest in improving safety and quality. This physician will:
- o Explain the project to medical staff who have patients on the unit
- Assist with education of medical staff about the rationale for implementing a CAUTI reduction project and the appropriate indications for urinary catheter use
- Participate in the CUSP activities of the project
- Encourage project support

Administration: Recruit a senior executive to be your unit sponsor and to demonstrate that this project is a priority for the hospital. Tips for recruiting and working with a senior executive are detailed in <u>section five</u> of this manual, which describes CUSP.

Develop Processes for Project Implementation

- Develop a process to evaluate the prevalence and appropriateness of urinary catheters on your unit. The process should be one that best fits your unit. Consider making this a part of rounding process that already exists. Most importantly, the process for evaluating the appropriateness of catheters must be standardized and used consistently. Write this process up using the Hospital Unit Action Plan.
- Determine who will contact the physician to request an order for discontinuance of inappropriate urinary catheters unless a nurse approved protocol for the removal of catheters exists.
 - Teamwork tools such as those found in the CUSP toolkit or <u>TeamSTEPPS</u>, may be helpful to facilitate communication about the appropriateness of catheters and the recommendation for catheter discontinuance.
 - Consider revising current processes, policies and procedures to include automatic stop orders or removal protocols.
 - The process may be enforced by integrating it into the patient's daily nursing assessment.

Most importantly, the process for evaluating the appropriateness of catheters must be standardized and used consistently.

Education

Participate in National Calls

Participate in educational opportunities offered by the National Project Team. These opportunities include:

• National Onboarding Calls: Participate in the Onboarding Call Series. This series of calls gives teams the background information necessary to participate in the project. They begin approximately two weeks after Learning Session # 1 and continue biweekly.

Attend State Face-to-face Meeting

Attend the State Face-to-face Meeting. The Learning Session #1: Kickoff Meeting will occur in each state as the official program kickoff. This meeting provides an opportunity for your team to meet with the State Lead and other teams participating in the project.

Educate Staff

Educate unit staff on the science of safety and on appropriate indications for urinary catheter use.

- Watch the Science of Safety video with your unit:
 - This should include a formal instructional session about CAUTI, and appropriate indications for catheter use.
 - You may also provide staff with printed educational material, lectures, posters, pocket cards and a post-test found in Appendices M, N, O, Q, R, S, W, X, Y, Z, AA, BB, and CC.
- The most important education occurs during rounds where a project champion discusses the appropriate indications for urinary catheter use with the unit staff:
 - A champion (usually a nurse, alternatively an infection preventionist, or quality improvement health care worker who is knowledgeable of indications for urinary catheter utilization) participates in a daily process to assess each patient for the presence and appropriateness of urinary catheters.
 - This may occur during daily rounding, in which nursing staff assess each patient for urinary catheter presence. The nurses should be educated in the indications for urinary catheter utilization. If a patient has a urinary catheter, review the reasons for use with the nurse caring for the patient.
 - If there are no valid indications for the urinary catheter, the nurse should contact the physician to discontinue the urinary catheter.

Develop an Educational Plan

Develop a plan for ongoing education of staff (including physicians) about the appropriate indications for urinary catheter use and the proper care and maintenance of catheters. A key factor of success is a manager who supports the initiative and holds staff accountable for removing all non-indicated urinary catheters. PowerPoint presentation templates are available in Appendices W, X, and Y.

Data

Lay Foundation for Data Collection

Lay the foundation for data collection. Project success depends on the ability of hospital teams to successfully collect and submit data. Determine who will collect and submit your unit's data for this project:

- Prevalence and Appropriateness (Process)
- CAUTI Rates by patient days and catheter days (Outcome)
- Team Check-up Tool
- Hospital Survey on Patient Safety Culture (HSOPS)
- CAUTI Readiness Assessment
- Submit data according to the timelines outlined in Table 7: Data Collection Schedule.

Phase 3: Execution

Table 11: Execution Phase Worksheet

Implementation Step	Resources	Due Date
Execution		
Utilize Teamwork and Communication Tools		
Learn from Defects		
On the CUSP: Stop CAUTI Team Meeting		
Education		
Attend Learning Session # 2- Midcollaborative		
Meeting		
Participate in National Calls		
Continuing Education		
Educate Other Units		
Data		
Baseline Data Collection		
Ongoing Data Collection		
Review Reports and Monitor Rates		
Use Data for Improvement		
Coaching Support		
Participate in State Coaching Calls		
State Site Visits		

Execution

Use Teamwork and Communication Tools

Use tools described in section five to improve teamwork and communication in your unit. You're *On the CUSP: Stop CAUTI* team can decide which tools are most appropriate for use in your unit.

Learn from Defects

- Investigate all infections.
- Regularly identify defects and walk through at least one defect each quarter with your team. Use this as an opportunity to learn from defects. This can occur at your CUSP team meeting or in another setting.

On the CUSP: Stop CAUTI Team Meeting

Meet at least once per month with your *On the CUSP: Stop CAUTI* team including your executive partner, team leader, nurse champion, and physician champion. Meet more frequently if your team finds it useful to do so. Use this time to assess changes that could be made to reduce harm and improve the culture of safety on your unit.

Education

Attend State Face-to-face Meeting

Attend the State Face-to-face Meeting. The Learning Session #2: Midcollaborative meeting will occur in each state around the eighth month. This in-person meeting provides an opportunity for teams to assess progress, share data and discuss leadership and followership.

Participate in National Calls

Participate in educational opportunities offered by the National Project Team. These opportunities include:

- National Onboarding Calls: Participate in the Onboarding Call Series. This series of four calls gives teams the background information necessary to participate in the project. They begin approximately two weeks after Learning Session # 1 and continue biweekly.
- National Content Calls: Content calls are 60-minute conference calls led by national project faculty advisors. Teams should attend this call series following the conclusion of the Onboarding Call Series.

Continuing Education

- Educate any new staff who join your unit using the Science of Safety video
- Use Learning from Defects and the Team Checkup Tool to ascertain places where education is still needed. Revisit slides, call recordings, or other materials for subjects on which your team needs more training.
- Give feedback on results of program implementation.
- Champion the program, and lead by example.
- Educate unit staff about improvements the team is making by:
 - Posting a CAUTI calendar banner
 - Displaying reminders around the unit

- o Holding unit education sessions
- Sharing and recognizing achievements
- o Sharing data with staff by regularly posting reports for staff

Educate Other Units

Engage others outside of your unit and increase awareness of your team's efforts by:

- Displaying CAUTI posters outside of your unit
- Posting reminders outside of your unit
- Creating an elevator speech to inform others you meet in passing
- Including monthly progress reports on bulletin boards or in newsletters
- Post updates on hospital Intranet

Data

Collect Baseline Data

- For baseline data, collect three weeks (Monday through Friday) of urinary catheter prevalence. Evaluate the need for urinary catheters, and determine the reason for all urinary catheters used.
- Complete and submit an initial Hospital Survey on Patient Safety Culture (HSOPS)
- Complete and submit the CAUTI Readiness Assessment one time per unit

Ongoing Data Collection

- Data collection is not just an exercise in collecting information, but it is a key part of the intervention. Collection of the process data in particular provides an opportunity to discuss and reinforce the daily assessment of whether catheters are needed, identification of appropriate indications, and removal of the catheters that are no longer indicated.
- For implementation data collection, process data should be collected once a day for two weeks (Monday through Friday) and then one day a week for the following six weeks. Outcome data should be collected for two full months every day according to the data collection schedule in <u>Table 7</u>. The patient's bedside nurse should note the catheter's presence and evaluate the indication during the patient's daily nursing assessment.
- Submit data into Care Counts and/or NHSN.
- Complete the quarterly Team Checkup Tool.

Review Reports, and Monitor Rates

Review reports at your *On the CUSP: Stop CAUTI* team meetings. Use these reports to monitor your rates and see where improvement is still needed.

Prevalence reports are available on Care Counts. You may also calculate the prevalence rate by taking the sum of urinary catheters used over a time period and dividing that number by the total patient days during that period.

Use Data for Improvement

Use data to inform the unit of areas where improvement is still needed, and post rates in a highly visible place where staff can easily see them.

Coaching Support

Participate in State Coaching Calls

The National Project Team and your State Lead will provide coaching support through regular coaching calls. These calls occur monthly during this period.

State Site Visits

The National Project Team and the Extended Faculty will visit hospitals in each state starting in the Execution phase of the collaborative. The hospitals will be chosen by the State Lead and the hospital(s) chosen will be contacted in advance of the visit.

Phase 4: Sustainability

Table 12: Sustainability Phase Worksheet

Implementation Step	Resources	Due Date	
Sustainability	Sustainability		
Use Teamwork and Communication Tools			
Learn from Defects			
On the CUSP: Stop CAUTI Team Meeting			
Education			
Attend Learning Session # 3: Final Meeting			
Participate in National Calls			
Continuing Education			
Educate Other Units			
Data			
Ongoing Data Collection			
Review Reports, and Monitor Rates			
Use Data for Improvement			
Coaching Support			

Participate in State Coaching Calls	
State Site Visits	

Use Teamwork and Communication Tools

Continue to use tools mentioned in <u>section five</u> to improve teamwork and communication in your unit. You're *On the CUSP: Stop CAUTI* team can decide which tools are most appropriate for use in your unit.

Learn from Defects

Continue to investigate all symptomatic infections and identify defects quarterly.

On the CUSP: Stop CAUTI Team Meeting

Meet at least once per month with your *On the CUSP: Stop CAUTI* team including your executive partner, team leader, nurse champion, and physician champion. Meet more frequently if your team finds it useful to do so. Use this time to assess changes that could be made to reduce harm and improve the culture of safety on your unit.

Education

Attend State Face-to-face Meeting

Attend the State Face-to-face Meeting. The Learning Session #3: Final meeting will occur in each state around the eighteenth month. This in-person meeting provides an opportunity for teams to celebrate their successes and discuss sustainability.

Participate in National Calls

Participate in educational opportunities offered by the National Project Team. These opportunities include the National Content Calls.

Continuing Education

- Educate any new staff who join your unit using the Science of Safety video
- Use Learning from Defects and the Team Checkup Tool to ascertain places where education is still needed. Revisit slides, call recordings, or other materials for subjects on which your team needs more training.
- Give feedback on results of program implementation.
- Champion the program, and lead by example.
- Educate unit staff about improvements the team is making by:
 - Posting a CAUTI calendar banner
 - Displaying reminders around the unit
 - Holding unit education sessions
 - Sharing and recognizing achievements
 - Sharing data with staff by regularly posting reports

Educate Other Units

Engage others outside of your unit and increase awareness of your team's efforts by:

- Displaying CAUTI posters outside of your unit
- Posting reminders outside of your unit
- Creating an elevator speech to inform others you meet in passing
- Including monthly progress reports on bulletin boards or in newsletters
- Post updates on the hospital Intranet

Data

Ongoing Data Collection

- For ongoing data collection, process data should be collected once a day for one week (Monday through Friday) quarterly. Outcome data should be collected for one full month every day each quarter. This is outlined further in the data collection schedule in <u>Table 7</u>. During this period, the patient's bedside nurse should continue to note the catheter's presence and evaluate the indication during the patient's daily nursing assessment.
- Continue to submit data into Care Counts and/or NHSN.
- Complete and submit final Hospital Survey on Patient Safety Culture (HSOPS).

Review Reports, and Monitor Rates

Continue to review reports at your *On the CUSP: Stop CAUTI* team meetings. Use these reports to monitor your rates and see where improvement is still needed.

Use Data for Improvement

- Post rates in a visible area where staff can see them.
- If there is no improvement from the baseline, then evaluate the unit for reeducation and re-implementation of the program.

Coaching Support

Participate in State Coaching Calls

Your State Lead will provide coaching support through regular coaching calls. The frequency of these calls is determined by your State Lead.

State Site Visits

The National Project Team and the Extended Faculty will visit hospitals in each state starting in the Execution phase of the collaborative. The hospitals will be chosen by the State Lead and the hospital(s) chosen will be contacted in advance of the visit.

Project Milestones

Each phase of *On the CUSP: Stop CAUTI* has unique milestones for you to complete. The lists below summarize milestones for each stage. They are also illustrated in <u>image two</u>.

Start-up Phase

• Participate in Orientation call

Planning Phase

- Attend Learning Session #1- Kickoff Meeting
- Complete Hospital Unit Action Plan
- Complete the CAUTI Readiness Assessment
- Participate in Onboarding calls

Execution Phase

- Complete baseline HSOPS
- Attend Learning Session #2- Midcollaborative Meeting
- Collect process and outcome data
- Participate in content calls
- Participate in coaching calls
- Complete the Team Checkup Tool
- If selected by State Lead, host a site visit

Sustainability

- Attend Learning Session #3- Final Meeting
- Collect quarterly process and outcome data
- Complete final HSOPS
- Participate in coaching calls
- Complete the Team Checkup Tool
- If selected by State Lead, host a site visit

Timeline



Image 1: On the CUSP: Stop CAUTI Project Milestones

Sustainability and Spread

Sustainability

Sustainability is marked by the ability to continue the components of *On the CUSP: Stop CAUTI* as part of routine workflows. This can be accomplished by building assessments into the daily work. Reinforce the importance of compliance with indications by presenting feedback data even after the period of required data collection has ended. Identify a facilitator who will take responsibility for reinforcing the process after the initial intervention is completed. This could be a nurse, a case manager, a discharge planner, or a team member of another discipline, but it should be someone who is committed to this role. Create a plan for continuation and integration. This could include education in orientation, annual competencies, or a strategy to address resurgent rates. It is important to understand that while the *On the CUSP: Stop CAUTI* program has a limited duration, it is based on the 4 E's, a cyclical, continuous process of improvement.

Successful sustainability will depend on having a trained champion to continue this effort on the unit; providing periodic feedback on performance to the unit's project team, nurses, medical staff and administration; and implementing CUSP principles on the unit, to emphasize patient safety, engage staff participation and encourage empowerment, and identify and learn from safety defects.

Spread Strategy

In the implementation stage, begin reaching out to teach other units about the initiative. Continue these activities over time to spread learning to other units. You may do this by displaying CAUTI posters outside of your unit, posting updates on the hospital intranet, or posting reminders outside of your unit. Simply put, spread within a hospital is about actively disseminating effective practices and knowledge about an intervention to all relevant care settings in the hospital.

To facilitate spread, consider volunteering to meet with interested units to share what you have learned or to communicate the success you've had in reducing CAUTI rates in your unit. Start with units with higher CAUTI rates. Share this manual and the other resources available on the project web site with the unit, and make yourself available to coach other unit teams in CAUTI prevention and in the CUSP model.

You may take a more proactive approach and offer to train team leaders to serve as mentors for other units. Teaching other units not only benefits the rest of your hospital, but it can also benefit you. Through teaching others, you can solidify your own knowledge of the subject plus learn from the unique challenges that other units face. It is also a way for your team to ensure equal protection for all patients in your hospital.

Getting Help

Table 12: Project Contacts

STATE PROJECT LEAD				
Names and contact information for State Leads can be found at				
http://www.onthecuspstophai.	http://www.onthecuspstophai.org/about-us/states-and-hospital-participation/			
State Lead Name and Title:				
Phone:	ne:Email:			
MHA KEYSTONE CENTER FACUL	.TY			
Name and Title	State Assignments	Email	Phone	
Christine George, RN, MS Director, National Collaboratives		cgeorge@mha.org	517-886-8404	
Barbara Meyer Lucas, MD, MHSA Physician Consultant		blucas@mha.org	313-399-7445	
Marie Masuga, RN, MSN, BSN Project Coordinator	mmasuga@mha.org 517-348-3910			
Jodie Elsberg, MS, MBA Project Coordinator		jelsberg@mha.org	517-886-8384	
Nicole Peterson Project Specialist	npeterson@mha.org 517-886-8437			
THE NATIONAL PROGRAM OFFICE AT HRET				
General Inquiries	onthecuspstophai@aha.org			
Marchelle Djordjevic, MBA Senior Program Manager	mdjordjevic@aha.org			

Table 13: Online Resources

Web Site	Focus	Available Resources
www.onthecuspstophai.or g	The web site of the national, AHRQ-funded CUSP initiatives to eliminate HAIs, including <i>On the CUSP: Stop</i> <i>CAUTI</i>	STOP CAUTI > MANUALS AND TOOLKITS• Registration Materials• Timelines and Checklists• Science of Safety Video• Data Entry Training• Implementation ToolkitsSTOP CAUTI > LEARNING SESSIONS• Content Call Recordings and Slides• Coaching Call Information
www.mhacarecounts.org	The secure, web-based data portal of <i>On the CUSP: Stop</i>	Enter baseline and monthly CAUTI data, HSOPS data, and Team Checkup Tool data, and run reports to communicate progress to your team and senior leaders.
www.cdc.gov/nhsn	Home of the National Healthcare Safety Network, the web-based surveillance system of the Centers for Disease Control and Prevention	ABOUT NHSN Purposes of NHSN Confidentiality Use of Data <u>NHSN MANUALS</u> <u>CONTACT NHSN</u>

Web Site	Focus	Available Resources
www.catheterout.org	A web site developed by a team of CAUTI experts that provides CAUTI prevention guidance along with supporting evidence.	Supporting Evidence Engaging Clinicians and Administrators

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Implementation Guide to Central Line Associated Blood Stream Infections (CLABSI)

HRET Contact <u>hen@aha.org</u> (312) 834-7056 www.hret-hen.org

Central Line Associated Blood Stream Infections (CLABSI) Overview

Background:

CLABSIs result annually in:

- 84,551-203,916 preventable infections
- 10,426-25,145 preventable deaths
- \$1.7-21.4 billion avoidable costs

*Umscheid, CA, et al. estimates the proportion of reasonably preventable hospital-acquired infections and associated mortality and costs.

Suggested AIM:

- To reduce the mean CLABSI rate to less than 1 per 1,000 catheter days over two years
- To improve safety culture

Potential Measures:

- Outcome:CLABSI Rate: (# of CLABSI/# central line days per month) X 1,000
Central line device utilization ratio = # CL days/# unit pt days per monthProcess:Central line insertion bundle compliance rate
Central line maintenance bundle compliance rate
- Culture: Hospital Survey on Patient Safety Culture Team Check-up Tool

Primary Drivers	Secondary Drivers
Adopt guidelines for	✓ Use an insertion checklist that includes all bundle elements for central line insertions (maximum barrier
catheter insertion	precautions, chlorhexidine skin antisepsis, optimal site selection)
	✓ Avoid the use of femoral vein for central venous access in adult patients
	✓ Establish a process to assure correct insertion technique by all individuals inserting catheter
	✓ Empower nurses to stop insertion if element(s) of the bundle are not being executed
Remove catheters as	✓ Include daily review of line necessity into daily rounds, with prompt removal if catheter is no longer indicated
soon as possible	✓ State the line day (e.g., "line day 6") during daily rounds as a reminder of how long the line has been in place
	✓ Define an appropriate timeframe for regular review of necessity, such as weekly, when central lines are placed
	for long-term use (e.g., chemotherapy, extended antibiotic administration, etc.)
Ensure appropriate	✓ Standardize dressing change policies
care and maintenance	✓ Adopt a process for access into the central line (scrub the hub process)
Availability of supplies	✓ Develop a process to assure proper equipment is available – Central line insertion kit, Central line dressing kits,
and equipment	administration sets, needleless systems
	✓ Keep equipment stocked in a cart for central line placement to avoid the difficulty of finding necessary
	equipment to institute maximal barrier precautions
Adaptive changes	✓ Adopt a senior leader as part of the improvement team
	✓ Engage frontline workers
	✓ Adopt team and communication skills
Adopt guidelines for	✓ Use an insertion checklist that includes all bundle elements for central line insertions (maximum barrier
catheter insertion	precautions, chlorhexidine skin antisepsis, optimal site selection)
	✓ Avoid the use of femoral vein for central venous access in adult patients
	✓ Establish a process to assure correct insertion technique by all individuals inserting catheter
	✓ Empower nurses to stop insertion if element(s) of the bundle are not being executed

Making Changes:

• This intervention is in <u>the Collaborative with Reducing Infections (Stay FIT Collaborative</u>). National meetings, webinars, monthly coaching calls, change packages and other tools will augment state association activities. The Collaborative will leverage the IHI Model for Improvement (Plan-Do-Study-Act).

Key Resources:

- On the CUSP: Stop BSI Manual, Released April 2009, National Implementation of the Comprehensive Unit-based Safety Program (CUSP) to Reduce Central Line Associated Blood Stream Infections (CLABSI) in the ICU <u>www.onthecuspstophai.org</u>
- Pronovost P, et al, "An Intervention to Decrease Catheter-related Bloodstream Infections in the ICU." Engl J Med, 2006, Dec28:335(26):2725-32.
- IDSA and SHEA Compendium on CLABSI: <u>http://www.jstor.org/stable/10.1086/591059</u>
- IHI How to Guide Preventing CLABSI: <u>http://www.ihi.org/knowledge/Pages/Tools/HowtoGuidePreventCentralLineAssociatedBloodstreamInfection.aspx</u>





On the CUSP: Stop BSI

Central Line-Associated Blood Stream Infection Toolkit

Prepared for:

Agency for Healthcare Research and Quality (AHRQ) U. S. Department of Health and Human Services (HHS)

Contract Number: HHSA290200600022; Task Order # 7

Contract Title:

National Implementation of the Comprehensive Unit-based Safety Program (CUSP) to Reduce Central Line Associated Blood Stream Infections (CLABSI) in the ICU

Contractor:

Health Research & Educational Trust, Chicago, IL

Prepared by:

Johns Hopkins Quality and Safety Research Group Michigan Health and Hospital Association Keystone Center for Patient Safety & Quality

April 2009

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*The Michigan Experience (NEJM 2006; 355(26):272502732) Fact Sheet	Appendix A Appendix B
CDC/NHSN CLABSI Definitions (Am J Infect Control 2008; 35(5):309-332)	Appendix C
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Central Venous Access Device Training Slides	Appendix E
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* Included in annotated bibliography

How to Use This Toolkit

The purpose of this toolkit is to support your efforts to implement evidence-based practices and eliminate Central Line Associated Blood Stream Infections (CLABSIs) in your clinical area. The strategies in this toolkit have nearly eliminated CLABSIs in participating Michigan intensive care units (ICUs) (Appendix A). These strategies have been adopted by over 100 ICUs in large and small, academic and community hospitals that we have worked with to date. Most of these ICUs have demonstrated a significant reduction in their CLABSI rates and many have not had a CLABSI in >6 months.

Nevertheless, your leadership is needed to achieve these results in your clinical area. Most of your efforts will be working with staff that insert and assist with the insertion of central lines. We developed a model to help disseminate this, and other, interventions. This model includes 4 stages that answer the following questions:

- 1. Engage: How will this make the world a better place?
- 2. Educate: How will we accomplish this?
- 3. Execute: What do I need to do?
- 4. Evaluate: How will we know we made a difference?

This toolkit provides details of what you should do in each of these stages. In the appendices, we provide all the tools you will need to eliminate CLABSIs in your clinical area; the rest is up to you.

Engage: How does this make the world a better place?

You need to help staff understand that CLABSIs are associated with significant morbidity, mortality, and costs.^{1,2}Patients in ICUs are at an increased risk for CLABSIs because 48% of ICU patients have indwelling central venous catheters accounting for 15 million central line days per year in United States (U.S.) ICUs.¹Assuming an average CLABSI rate of 5.3 per 1000 catheter days and an attributable mortality of 18% (0-35%), as many as 28,000 ICU patients die from CLABSIs annually in the U.S. alone.²⁻⁴Therefore, efforts to decrease the rate of CLABSIs and improve the quality of ICU care are paramount.

To engage your colleagues, first make the problem real by telling a story of a patient who developed a CLABSI in your clinical area. Identify a patient in your clinical area that has suffered needless harm from a central line and share the patient's story with your colleagues. In our ICU, for example, we tell the story of a 46 y.o. mother of two, Jane Doe (an alias for the purpose of this toolkit) who suffered an irreversible hypoxic brain injury from sepsis due to a CLABSI. Share your story openly with your colleagues and leadership. Ask them if this is the kind of care they would like for their family, if this is care they are proud of, if this is the best your clinical area can do?

Second, post the number of people who developed a CLABSI each month and the total number of CLABSIs for the previous year in your clinical area. To keep staff engaged, post a trend line so nurses and physicians can see at a glance your CLABSI rate and how it is changing over time. Post the number of days (weeks or months) since your last CLABSI. Use formal and informal opportunities to talk about the intervention and about unit specific infection rates. Make a point of

recognizing providers who appropriately follow the protocol. Invite your hospital infection control professional or epidemiologist to become an active part of your clinical area's improvement team and draw on their expertise to help with your specific challenges. The goal should be that no patient suffers harm from a preventable complication while in your clinical area.

Third, using baseline data on CLABSI rates in your clinical area, calculate the potential opportunity to improve for the number of preventable CLABSIs, preventable deaths, excess hospital days and costs per year. We have provided an Opportunity Calculator to help you calculate this for your clinical area (Appendix B). Share this information openly with your colleagues.

Finally, make sure your staff recognizes that benchmarking your performance against similar clinical areas and striving for the 50th percentile is unacceptable for preventable complications. Our goal should be that no patient suffers harm from a preventable complication while under our care. You can eliminate infections and any infection should be viewed as a defect.

Educate: How will we accomplish this?

Make sure your staff understands how they can reduce CLABSIs. Numerous interventions have reduced the incidence of CLABSI and the ensuing morbidity, mortality and costs.⁵⁻⁸In addition, the Centers for Disease Control (CDC),<u>http://www.cdc.gov/ncidod/dhqp/nhsn members.html</u>, the Society of Critical Care Medicine (SCCM), the Society of Healthcare Epidemiologists of America (SHEA), the Infectious Disease Society of America (IDSA) and several other societies have developed evidence graded guidelines for the prevention of catheter-related infections.⁹Several of the guideline recommendations are supported by well-done clinical trials or systematic reviews and include the appropriate use of hand hygiene, chlorhexidine skin preparation, full-barrier precautions during central venous catheter insertion, avoiding the femoral site when possible and maintaining a sterile field while inserting the line.¹Improving compliance with these evidence-based practices will result in dramatic reductions in CLABSI rates in your clinical area.

We strongly recommend that you identify who the hospital epidemiologist or infection control practitioner is for your hospital/unit and partner with them to reduce CLABSIs in your clinical area. You can work with them to:

- 1. Ensure you are using NHSN definitions for CLABSI (Appendix C & D)
- 2. Educate staff about how to reduce CLABSI
- 3. Ensure you have chlorhexidine in your central line kits
- 4. Publicly post the number of people infected per month and your quarterly infection rates

Using baseline data on CLABSI rates in your clinical area, you can easily calculate the number of preventable CLABSIs, preventable deaths, excess hospital days and costs per year. Again, we will provide you with an Opportunity Calculator to help you calculate this for your clinical area but providers often want to know how these calculations are derived. If your CLABSI rate is 5.3 per 1000 catheter days and your clinical area has 2500 catheter days per year, you have 13 preventable CLABSIs every year. The calculation is: 5.3/1000 x 2500. If we assume that the mortality associated with a CLABSI is18%, then there will be 2 preventable deaths (13 preventable CLABSIs x 0.18) per year in your clinical area. If we assume that patients stay in the hospital for an additional 13 days if they develop a CLABSI, then 13 CLABSIs leads to 169 excess hospital days per year (13 preventable CLABSIs x 13 hospital days). If we assume the cost of each CLABSI is \$45,254, then

your CLABSIs translated into an extra \$588,302 per year (13 preventable CLABSIs x \$45,254). Actual estimates of mortality, LOS and costs of care vary by clinical area but these estimates are consistent with those published in the literature.¹⁰Share this information openly with your colleagues.

Execute: What do I need to do?

There are 5 steps in the CLABSI toolkit:

- 1. Educate staff by distributing a FACT SHEET and hold in-services for bedside providers.
- 2. Reduce complexity by creating a line insertion cart.
- 3. Ask providers daily whether catheters could be removed.
- 4. Implement a checklist during catheter insertion to ensure adherence to evidence-based guidelines for preventing CLABSIs.
- 5. Empower staff to stop the catheter insertion procedure if a violation of the guidelines is observed.

Step 1: Educate staff

The biggest barrier to compliance with evidence-base practice is not that providers disagree with the evidence but rather that providers don't know the evidence exists or don't know what they should be doing. To educate providers about the evidence-based practices we have developed a one page FACT SHEET (Appendix B). We recommend that you distribute the FACT SHEET to all staff members. We have also provided a PowerPoint presentation that you may use for education (Appendix E). Consider staff in-services to review the presentation, review the FACT SHEET and allow providers to have their questions answered. Consider using a quiz (Appendix F) to test the provider's knowledge after the in-service and requiring providers to pass the quiz prior to being allowed to insert central lines in your clinical area.

Once a week for two consecutive weeks, determine the number of providers that have received the FACT SHEET and/or completed the quiz. If <90% of providers received the FACT SHEET and/or completed the quiz, plan a meeting with your team to evaluate additional opportunities to increase knowledge among providers.

We have also provided a copy of the SHEA/IDSA Strategies to Prevent Central Line-Associated Bloodstream Infections in Acute Care Hospitals (Appendix G), our vascular access device policy (Appendix H), and our policy for changing a central venous access device dressing (Appendix I) that you may find useful as additional resources. The procedures detailed in our vascular access device policy include the standard requirements for training, VAD site selection, insertion, site assessment, dressing change requirements, documentation requirements, appropriate flushing procedures, tubing replacement and central catheter removal and/or replacement requirements. These are examples that you may find helpful as you revise or develop your own protocols. As you make this project your own you will also have a chance to share protocols developed by other teams in the collaborative.

Step 2: Create a central line insertion cart

We identified that a potential barrier to compliance with the evidence-based practices in our ICU was that physicians had to go to several different places to collect the equipment needed to comply with

the CDC guidelines. If this is also true in your clinical area, simplify the process by establishing a central line insertion cart that contains the equipment and supplies needed and thereby reduce the number of steps required.

Gain consensus on what supplies should be included and how the central line cart should be organized in your clinical area. We use an A-Smart Standard Cart from Armstrong medical (<u>http://www.armstrongmedical.com/</u>) that can be rolled to the patient's room. We have the 4-drawer variety but can be ordered with customized drawer space. Our current supply list for the line cart is provided in Appendix J. Adjust the cart content and organization to accommodate providers in your unit.

The use of 2% chlorhexidine for skin antisepsis before catheter insertion and during dressing changes is the preferred agent, unless the patient is allergic to chlorhexidine. This is a Category IA CDC recommendation (Strongly recommended for implementation and strongly supported by well-designed experimental, clinical, or epidemiologic studies). You should meet with your hospital's epidemiologist, infection control practitioner or senior leadership to ensure you have 2% chlorhexidine available.

Determine how often the cart needs to be stocked in your clinical area. Our support associate stocks the cart every four hours from the ICU supply room and signs off on the checklist located on top of the cart. Other clinical areas may be able to stock the cart less frequently depending on the number of lines placed each day. Adjust the frequency as needed to ensure it is stocked at all times.

Step 3: Ask providers daily whether catheters can be removed

One of the most effective strategies for preventing CLABSIs is to eliminate, or at least reduce, exposure to central venous catheters. The decision regarding the need for a catheter is complex and therefore difficult to standardize into a practice guideline. Nonetheless, to reduce exposure to central venous catheters, we should have a systematic approach to ask providers daily whether any catheters or tubes could be removed.

Develop a strategy to ensure that providers are asked whether any catheters or tubes could be removed. To ensure that this question was asked, we added it to the rounding form, called the Daily Goals worksheet (Appendix K) which is used to develop daily care plans for patients in our ICU. In addition, you could add this question to existing reporting mechanisms in your clinical area (nurse to nurse report forms, charge nurse report forms, for example). You should also develop a strategy to place tunneled catheters if central access will be required for a prolonged period of time to decrease the risk for infection.

Consider recording the number of central line days or the number of times per week that a central venous catheter was discontinued. Graph results over time using a run- chart. Make the results known to providers. If central venous catheters are not being discontinued, discuss with appropriate leadership and providers whether there may be an opportunity to decrease the number of central venous catheters used in your clinical area.

Step 4: Implement a checklist to be completed by the bedside nurse

Creating independent redundancies, through the use of a checklist, is an effective technique to monitor whether patients receive the care processes they should. Checklists are used extensively in aviation to create independent redundancies for key steps in a process. In addition, using a checklist allows nurses to serve as an independent, redundant check to encourage physician adherence to evidence-based practices.

We developed a checklist that you can adapt to your clinical area (Appendix L). We require the bedside nurse to be present during all central line insertions and they complete the checklist during every central venous catheter insertion. Pilot test the checklist in your unit for one week and interview several nurses regarding the clarity of the form, burden of data collection and the need for modification.

In our experience, a powerful strategy to demonstrate the opportunity for improvement in your clinical area is to establish baseline compliance with the evidence-based practices. Consider implementing a two week observation only phase where nursing staff observes the physicians during catheter placement and completes the checklist for each procedure. Physicians would not be aware that they were being observed during the observation only phase. You could then calculate the percent of central line insertions where providers were compliant with evidence-based practices and share these results openly with your staff.

Audit the percentage of central venous catheter insertions that had the checklist completed. Based on feedback, modify the form and provide in-services to the nursing staff.

When we first introduced the CLABSI checklist at Hopkins, staff expressed concern. Barriers identified included: 1) the nurses perception that their job was not to police physicians and 2) the physicians perception that credibility and authority would be challenged if they were critiqued or corrected by nursing staff. Our unit leadership met with nursing and physician staff to emphasize the focus on patient safety and teamwork. It would be analogous to watching anyone on the healthcare team enter a patient room and intentionally inflict patient harm. While we would never tolerate intentional harm, and this extreme scenario may never happen, that is in fact what we are doing when we allow providers to violate evidence-based infection control practices. When presented in this light, physicians and nurses in our ICU understood that they needed to work together to keep patients safe.

Step 5: Empower nurses to stop procedures if guidelines are not adhered to

While efforts to improve interpersonal communication have resulted in improved aviation safety, the same is not yet true in healthcare where the culture is still typically hierarchical. Successful implementation of the checklist requires effective interpersonal communication skills and provides a means to learn teamwork skills experientially.

Require the bedside nurse to complete the checklist during central venous catheter placement. Inform the physician staff that the checklist is being implemented if an observation only phase was implemented. Empower nurses to stop the procedure, absent an emergency, if they observe a violation in compliance with the evidence-based practices. Indicate if the procedure was stopped on the checklist. Develop a support system for the bedside nurse to minimize the risk of an undesirable encounter. For example, we instructed the nurse to page the unit director 24/7 if the physician, after the nurse identified a violation, failed to correct the violation. You should develop a strategy in your clinical area to support the bedside nurse.

Audit the percentage of central venous catheter insertions that had the checklist completed. Calculate compliance with evidence-based practice and the number of corrections required. Make the results known to providers.

Evaluate: How will we know that we made a difference?

The first step is to collect baseline rates of CLABSI in your clinical area for the past 12 months. To accomplish this, you will use the web-based data form. The second step is to track CLABSI rates over time in your clinical area. To accomplish this, you will continue to use the web-based data form. Your hospital's infection control staff should have the information needed to complete these forms.

While we encourage all clinical areas to adopt standardized definitions for CLABSI provided by the Centers for Disease Control (CDC) (Appendix C), we recognize that the definitions may vary among hospitals. We will identify whether your hospital uses a standard definition provided by the CDC. If your hospital uses definitions other than those provided by the CDC, you can submit data though we will not be able to benchmark your clinical areas performance against other hospitals. However, as long as your definition of an infection remains constant, you can evaluate trends over time in infection rates. We encourage the team leader to discuss these issues with the director of hospital epidemiology or infection control.

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Elimination of Elective Deliveries at Prior to 39 Weeks Gestation

HRET Contact <u>hen@aha.org</u> (312) 834-7056 <u>www.hret-hen.org</u>

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Obstetrical Harm/Early Elective Delivery (EED) Overview

Background:

- Obstetrical adverse events of some sort occur in approximately 9% of all US deliveries and range from perineal tears to hemorrhage for the mother and skeletal or spinal cord injuries to the neonate, as well as unplanned admits to the NICU. At least 50% of these events are preventable.
- Currently, many publications illustrate using the care bundle concept for process improvement that results in improved outcomes. This has been applied successfully in perinatal care.
- The Leapfrog Group announced that 39% of reporting hospitals kept their Early (<39 week) Elective Delivery (EED) rate under 5% and that 65% of reporting hospitals improved their rate in one year. Reducing elective deliveries prior to 39 weeks results in improved outcomes for mothers and babies including a reduced length of stay, reduced transfer to an elevated level of care, and decreased financial costs to the system.

Suggested AIMs:

- Reduce the elective delivery rate at less than 39 weeks confirmed gestation to <3% by December 31, 2013.
- Reduce the perinatal birth trauma rate (AHRQ PSI 17) by 50% by December 31, 2013.
- Demonstrate 95% or greater compliance on the IHI Bundles (Oxytocin and Vacuum) by December 31, 2013.

Potential Measures:

Outcome: -Elective Delivery Rate prior to 39 weeks gestation -Birth trauma rate for neonates (AHRQ PSI 17)

Process: -Compliance with oxytocin and vacuum bundle elements -Transfer rate to higher level of care

Primary Drivers	Secondary Drivers
Involve Perinatal	✓ Senior and middle level leaders assigned to local improvement team
Leadership	✓ Identify and nurture physician champions to support the implementation of policies to
	reduce EED
Reduce variation	✓ Implement March of Dimes (MOD) <39-Week Toolkit
	✓ Create a "hard stop" to assess the rationale for EED
	✓ Develop standard processes and protocols for response to obstetrical emergencies such as shoulder
	dystocia, postpartum hemorrhage, and emergency cesarean section.
	✓ Standardize administration of high alert meds – oxytocin, magnesium sulfate, epidurals
Effective	✓ Adopt common language using NICHD criteria
Teamwork &	✓ Implement team training, such as TeamSTEPPS or Crew Resource Management (CRM)
Communication	✓ Implement techniques for effective communication and improved handoffs, i.e. SBAR
	✓ Design and implement simulation training
	✓ Empower and support clinical staff to escalate issues when necessary
Respectful Patient	✓ Design processes to support partnership in care between provider, patient and family
Partnerships	✓ Educate patients and families about the benefits of full term (39-41 weeks) delivery
•	✓ Include patients and families on design and improvement teams
	✓ Communicate openly and honestly with family and patients at regular intervals

Making Changes:

• This intervention will be supported as an individual collaborative with best practice webinars, change packages and other tools that will augment state hospital association activities. Initially, the focus will be on EED and later move to other forms of perinatal harm.

Key Resources:

- Wagner, Meirowitz, Shah, et al. Comprehensive Perinatal Safety Initiative to Reduce Adverse Obstetric Events; Journal for Healthcare Quality, Volume 34, Issue 1, pages 6–15, January / February 2012
- IHI Perinatal Care Improvement Project: <u>http://www.ihi.org/IHI/Topics/PerinatalCare/</u>
- March of Dimes/CMQCC <39 Week Tool Kit: <u>http://www.cmqcc.org/_39_week_toolkit</u>





Reduction of Elective Deliveries at Prior to 39 Weeks Driver Diagram

AIM: Reduce the elective delivery rate at less than 39 weeks gestation to fewer than 3% of all deliveries by December 31, 2013

Primary Drivers	Secondary Drivers	Change Ideas
Reduction in DEMAND for elective deliveries at prior to 39 weeks gestation	 Raise awareness of risks of EED for physicians, nurses and hospital staff Raise the awareness of risks of EED for patients/families and the community 	 Provide education to physicians and nursing staff regarding the risks of early elective deliveries Provide data regarding outcomes of early elective deliveries in your hospital Utilize a physician champion to help educate and influence the medical staff Provide education to patients regarding the risks of early elective delivery Assist staff physicians to obtain available national educational tools to distribute in their offices Include this education in the admitting materials distributed to patients Partner with community organizations, the media and other groups to highlight the risks with EED
Reduction in AVAILABILITY of elective deliveries at prior to 39 weeks gestation	 Create a hospital policy and procedure that guides scheduling and oversight for elective deliveries Develop mechanisms to support the appropriate implementation and enforcement of policies and procedures 	 Include physicians in the development of the policy and procedure The policy is physician driven, and physician input and buy in from the start is crucial Use the physician champion to bridge the gaps Use an established, evidence based policy/protocol example for the policy that follows ACOG and national quality criteria. Include the elements of an elective induction bundle in the policy, such as the IHI Labor Induction Bundle Use an established policy sample from a statewide





Elimination of Elective Deliveries at Prior To 39 Weeks Gestation 5

Primary Drivers	Secondary Drivers	Change Ideas
		 or national perinatal improvement organization, such as the 39 Week Toolkit from CMQCC ✓ Establish procedures for approving exceptions to the policy Medical indications and exceptions must be decided upon by the Medical Staff Use established standards for exceptions from ACOG or The Joint Commission Clearly define in the policy who can determine the exception, such as the Chair of the Department ✓ Establish a defined procedure for scheduling elective deliveries A defined procedure includes a standardized format for scheduling that covers all required details for elective deliveries, such as gestational age and reason for induction ✓ Include a "Hard Stop," or instruction for halting the scheduling process when an attempt is made to schedule an induction that does not meet criteria Define in the policy the escalation process for the
		Chain of Command to be notified to make decisions when a Hard Stop occurs.

Key Resources:

Institute for Healthcare Improvement (IHI) Elective Induction and Augmentation Bundles; Update January 2009; <u>www.IHI.org</u>

California Maternal Quality Care Collaborative Toolkit to Transform Maternity Care/ 39 Week Toolkit; First edition published by March of Dimes, July 2010. www.CMQCC.org

ACOG. Clinical management guidelines for obstetricians-gynecologists: Induction of labor. American College of Obstetricians and Gynecologists Practice Bulletin Number 107 August, 2009.

TJC. Specifications Manual for Joint Commission National Quality Core Measures (20101a); Perinatal Care Core Measure Set. <u>www.jointcommission.org</u>


Reducing Elective Deliveries Prior to 39 Weeks Gestation

The last few weeks of pregnancy are critical to a baby's health because important organs, including the brain and lungs, are not completely developed until the end of pregnancy. A baby's birth should not be scheduled before 39 weeks of pregnancy, unless medically necessary. The Leapfrog Group, a coalition of public and private healthcare purchasers, reports that hospital rates of early elective deliveries range from less than 5% to more than 40%. The 773 hospitals from around the country that voluntarily provided Leapfrog with information on this measure reported over 57,000 early elective deliveries by cesarean section or induction during the reporting period. The variation in hospital rates has long been talked about in the health care community, but Leapfrog's release of 2010 data is the first real evidence that the practice of scheduling newborn deliveries before 39 weeks without a medical reason is common and varied among hospitals even in the same state or community.

Elimination of early elective deliveries requires effort on behalf of physicians, nurses and hospital leaders. Successful implementation of a 39-week induction program can only come from a commitment to providing care that is patient-centered and safe.

Suggested AIM Statements

Before the implementation work starts, the team must have a goal at which to aim. An AIM statement for Early Elective Delivery reduction efforts could include one of the following:

Decrease the elective delivery rate at less than 39 weeks gestation to less than 3% of all deliveries by December 31, 2013.

Decrease the early elective delivery rate by 50% within 12 months and achieve a rate of less than 3% of all deliveries by December 31, 2013.

Reduce DEMAND for Elective Deliveries at Prior to 39 Weeks Gestation

Reducing the demand comes from education to both clinicians and patients. An awareness of the risks involved curtails the requests for convenience, or early elective, deliveries. National guidelines, media attention and successful regions that have eliminated elective deliveries prior to 39 weeks gestation are all helpful in increasing the organizational will to reduce demand.

Secondary Driver: Awareness of Risks of Early Elective Deliveries by Physicians, Nurses and Patients

Patients and practitioners must understand the risks when delivering at less than 39 weeks without medical indications. Generally, resistance to change around <39-week deliveries is due to perception of little or no harm to the baby or increased risk to the mother. Provide a summary of evidence from literature to clinicians who are resistant to change, and provide data and feedback on your hospital outcomes in general and specifically on the clinician's practices¹.

Change Ideas: Provide education to physicians and nursing staff

- Provide clinicians with data about their patients' complications (maternal and neonatal). Emphasize avoiding elective deliveries at less than 39 weeks.
- Use a physician champion to communicate the reasons for and importance of the initiative to medical staff.
- Use a nursing champion to communicate the reasons for and importance of the initiative to the nursing staff.

Change Ideas: Provide education to patients

• Provide patients with educational materials that define "full term" and emphasize the importance of eliminating elective deliveries prior to that time.



- Use hospital marketing to educate patients about the 39 week initiative.
- Work with local media on the 39 week initiative.
- Connect with the March of Dimes program in your region on the 39-week initiative.
- Develop patient education materials and provide to your physicians' offices for their waiting rooms and for distribution during prenatal classes.

"Hardwiring" the reduction in demand for elective deliveries at prior to 39 weeks as part of the improvement plan:

Assist the physician champion by arming him/her with the most up to date research from obstetrical quality resources. Have the physician champion discuss the research and current recommendations at medical staff meetings and in newsletters. Do a retrospective review of hospital data findings from elective deliveries at prior to 39 weeks' gestation to give the medical staff baseline data from which to work. Utilize the physician champion to address concerns by the medical staff, and to distribute current research and data. A physician champion does not need to be a physician who holds a "title," such as department chair or department director. A good physician champion is:

- ✓ Respected as a physician by his/her peers.
- ✓ Good at communicating with other physicians and hospital staff.
- ✓ Willing to stand up *when needed* (has courage, but not a bully).
- ✓ One who possesses good social skills and relationships within the hospital.

Reduce AVAILABILITY of Elective Deliveries at Prior to 39 Weeks Gestation

Reducing the availability comes from a physician-driven, nurse-administered, hospital leadership-supported policy for elective inductions and the process for scheduling. Implementing the elective induction bundle and a policy that includes a "hard stop," if supported by physician and hospital leadership, will lead to successful reduction in convenience deliveries.

Secondary Driver: An enforceable hospital policy and procedure

Formalizing the elimination of elective deliveries at prior to 39 weeks' gestation requires policies and procedures that govern care and are based on evidence based protocol examples.² A policy that specifically defines acceptable instances of early elective delivery eliminates guesswork for clinicians and hospital staff, and sets clear guidelines for care delivery. Support from medical staff and hospital leadership is necessary to assist front-line nursing staff to be the "gate-keepers" for policies. It is imperative that staff members know that hospital leadership is in support of the policy. An elective delivery policy is primarily physician driven and requires buy-in from the medical staff to be successful.

Change Ideas: Include physicians in the development of the policy and procedure

- Utilize a physician champion to communicate with and engage the Medical Staff in the improvement project.
- Establish "ownership" of the policy by the Medical Staff in the policy.

Change Ideas: Use an established, evidence based policy/protocol

- Include the Elective Induction Labor Bundle³ elements in the policy:
- 1. Gestational age 39 weeks or greater required to induce the patient.
- 2. Organization should specify method of dating pregnancies.
- 3. Reassure fetal status prior to induction.
- 4. Organization should specify a required amount of time for fetal monitoring prior to induction
- 5. Pelvic exam prior to induction.
- 6. Pelvic exam necessary to check for cephalo-pelvic disproportions, assess potential difficulties during



delivery.

- 7. Absence of hyper stimulation on fetal monitor.
- 8. Organization should implement NICHD Standardized Nomenclature⁴ for fetal monitoring documentation in order to eliminate confusion regarding fetal status.
- Use a sample policy already developed by a maternal quality care collaborative such as The March of Dimes, state Medicaid programs, or perinatal safety programs.⁵

Change Ideas: Establish procedures for approving exceptions to the policy

- Use physician leadership to define "medical necessity" for elective deliveries at prior to 39 weeks using ACOG and national quality criteria.⁶,⁷
- Set clear guidelines and define the escalation process for who can approve an early elective delivery based on medical necessity, such as the Chair of the Department.

Change Ideas: Establish a defined procedure for scheduling elective deliveries

- The policy should clearly define the process for scheduling elective deliveries that include the required information in order to schedule.
- This information should include gestational age and indication for induction/cesarean section.
- The procedure should also clearly define the chain of command if an induction/cesarean section does not meet criteria.
- Create standardized forms for scheduling that includes all of the required information (See Appendix A)

Change Ideas: Include a "Hard Stop," or instruction for halting the scheduling process, when an attempt is made to schedule an induction that does not meet criteria

- Include specific detail about the chain of command to be notified when a "Hard Stop" is implemented.
- Include specific detail about the responsibilities and expectations for team members when a "Hard Stop" is implemented and guidance to resolve the issue

"Hardwiring" the reduction in availability for elective deliveries at prior to 39 weeks as part of the improvement plan:

Measure compliance with the elective delivery policy by collecting data on deliveries at prior to 39 weeks gestation. Complete an in-depth review of any "fallouts" to determine the cause(s). Continue to discuss the scheduling process with staff during staff meetings and use the feedback from team members to further refine and improve the scheduling process. Listen to physicians who provide feedback about potential delays in scheduling due to the new policy and use that feedback to also refine and improve the process. Continue to report outcomes data on all elective deliveries to the medical staff. Support from medical staff and hospital leadership is necessary to assist front-line nursing staff to be the "gate-keepers" for policies. It is imperative that staff members know that hospital leadership is in support of the policy.

Suggested Process Measures:

- Measure the use and completion of a standardized tool for scheduling elective deliveries.
- Review all "fallouts" (early elective deliveries without medical indications) with medical staff and nursing staff.
- Measure compliance with all elements of the labor induction bundle.

Potential Barriers:

Recognize that for many physicians this will be a change in their practice. Decisions about timing of deliveries have always been at the discretion of the physician, not a function directed by policy. Include lead physicians in the improvement team. Select these leads to work as champions to dialogue with physician colleges and achieve accelerated implementation. Order sets and protocols maybe seen by some physicians as "cookbook" medicine. It



is actually "best recipe" medicine that uses what is known in the literature to provide the best opportunity for each patient based on his/her individual needs to receive the care that will reduce risk for harm.

Use administrative leadership sponsorship to help remove or mitigate barriers.

If physicians perceive a significant, unjustifiable loss of clinical autonomy, they may discuss moving to a nearby hospital for future elective deliveries. This may create a business and social challenge for the administration. Getting nearby hospitals to also implement the policy removes this barrier. Also, creating community awareness of the 39-week initiative makes it harder to "practice as usual" in a different location.

Including bedside nurses, physicians, and hospital leadership in the improvement team to develop protocols, work flows, conduct peer to peer education has been shown to be effective in successfully implementing best practices. It is important to start with the one early adopter physician who can help lead and then recruit early adopter champions.

A management executive sponsor, recognizing the value to the patients and the value to the organization of preventing harm, can help brainstorm solutions to what may appear to be added work, or provide resources to mitigate that additional work. An executive sponsor can also help to see the "big picture" on how this may impact organization-wide, and champion through requests for workflow change or supplies. Executive sponsors can help educate, lead and provide solutions to staffing barriers.

A senior or opinion leader physician is crucial to accomplish the goal of organization-wide adoption of best practices order sets.

This is not just a change in practice but may also be a change in culture:

This may very well require a change in culture, particularly physician culture. The physicians will be asked to trade their traditional way of individualizing pregnancy management for each patient for a more standardized and safe approach. This may appear to be a loss of control for the physician. Order sets and practice bundles can be worrisome to physicians who are not used to them. This will be a change in how they work. Physicians learn from peers. Most physicians will follow their peers before they will follow "expert advice."

EED is also an example of an innovation that will require small tests of changes and planned spread driven by success. The ideal end result is the development of team based care where each member of the team contributes to better and safer patient care. The new/updated scheduling process may be different, with more requirements than before its implementation. It is important to publicize the scheduling process well in advance; train schedulers and nursing staff to facilitate its implementation; and streamline the process, making it easy for physicians and their office staff to schedule patients.

Tips on How to Use the Model for Improvement to:

Reduce the Demand for Early Elective Deliveries

- Review the current hospital baseline data with one physician to start. Consider examining baseline rates for all physicians.
- ✓ Borrow from other organizations that have successfully implemented a 39-week delivery program.
- ✓ Utilize the national and statewide resources already working on this topic to obtain educational materials and other resources.
- ✓ Connect the physician champion with a national or statewide perinatal safety collaborative for support and resources.



Reduce the Availability of Elective Deliveries at Less Than 39 Weeks

- ✓ Put together a small team that includes physicians, nurses and hospital leadership. Review sample policies and forms.
- ✓ Ask one or two of the physicians on the committee to review the sample policies for help with adoption at your facility.
- ✓ Voluntary participation through the method of "asking for help improving, not approving" will often generate momentum and rapid improvement of the process.
- ✓ Forcing order sets on physicians before there is a critical mass of adopters generally is not effective and often sets the improvement effort back.
- Design a small pilot on the unit where the lead physicians and nurses are comfortable with testing the sample policy to determine any issues with implementation prior to piloting the policy and protocol on a larger scale. Remember that a small pilot test can be just that – small. Start with one patient, one physician, and one nurse.
- ✓ Don't wait for approval from all departments. The results of multiple small tests of change will ultimately guide successful implementation.



Key Resources:

The March of Dimes, *Towards Improving the Outcome of Pregnancy III*, December 2010, http://www.marchofdimes.com/TIOPIII FinalManuscript.pdf

• Comprehensive Guide to Current Research and Recommendations for Safe Perinatal care

The Institute for Healthcare Improvement on Perinatal Care Improvement, http://www.ihi.org/IHI/Topics/PerinatalCare/

• Complete listing of bundle elements for the Elective Induction and Labor Augmentation bundles

The March of Dimes/CMQCC 39 Weeks Toolkit http://www.cmqcc.org/ 39 week toolkit

• Includes sample policies, scheduling forms, implementation tips, education guide, data abstraction guide, and numerous tools to aid in implementation

Wagner, Meirowitz, Shah, et al. *Comprehensive Perinatal Safety Initiative to Reduce Adverse Obstetric Events;* Journal for Healthcare Quality, Volume 34, Issue 1, pages 6–15, January / February 2012

Cherouny PH, Federico FA, Haraden C, Leavitt Gullo S, Resar R. *Idealized Design of Perinatal Care*.

IHI Innovation Series white paper. Cambridge, Massachusetts: Institute for Healthcare Improvement; 2005.



Appendix I: Sample Scheduling Form



March of Dimes 39 Week Toolkit www.cmqcc.org / 39 Week Toolkit



Endnotes:

¹ Tita, et al. Timing of Elective Repeat Cesarean at term and Neonatal Outcomes. N Engl J Med 2009; 360:111-120

² Institute for Healthcare Improvement (IHI) Elective Induction and Augmentation Bundles Update January 2009; <u>http://www.ihi.org/knowledge/Knowledge%20Center%20Assets/Changes%20-%20ElectiveInductionandAugmentationBundles_befeac1c-01f5-4ab7-9ef6-90468f111b47/IHIElectiveInductionandAugmentationBundlesJan09.pdf</u>

³ Institute for Healthcare Improvement (IHI) Elective Induction and Augmentation Bundles Update January 2009; <u>http://www.ihi.org/knowledge/Knowledge%20Center%20Assets/Changes%20-</u> <u>%20ElectiveInductionandAugmentationBundles_befeac1c-01f5-4ab7-9ef6-</u> 90468f111b47/IHIElectiveInductionandAugmentationBundlesJan09.pdf

⁴ A Review of NICHD Standardized Nomenclature for Cardiotocography: The Importance of Speaking a Common Language When Describing Electronic Fetal Monitoring Barrett Robinson Rev Obstet Gynecol. 2008 Spring; 1(2): 56–60

⁵ Main E, Oshiro B, Chagolla B, Bingham D, Dang-Kilduff L, and Kowalewski L. Elimination of Non-medically Indicated (Elective) Deliveries Before 39 Weeks Gestational Age. (California Maternal Quality Care Collaborative Toolkit to Transform Maternity Care) Developed under contract #08-85012 with the California Department of Public Health; Maternal, Child and Adolescent Health Division; First edition published by March of Dimes, July 2010.

⁶ ACOG. Clinical management guidelines for obstetricians-gynecologists: Induction of labor. American College of Obstetricians and Gynecologists Practice Bulletin Number 107 August, 2009.

⁷ TJC. Specifications Manual for Joint Commission National Quality Core Measures (20101a); Perinatal Care Core Measure Set. 2009 [cited November 21, 2009]; Available from:

http://www.jointcommission.org/PerformanceMeasurement/PerformanceMeasurement/Perinatal+Care+Core+Measure+Set.html





Implementation Guide to Prevention of Falls with Injury

HRET Contact <u>hen@aha.org</u> (312) 834-7056 www.hret-hen.org



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Prevention of Falls With and Without Injuries Overview

Background:

- Among older adults (those 65 or older) falls are the leading cause of injury related death (CDC). They are also the most common cause of nonfatal injuries and hospital admissions for trauma.
- In the acute and rehabilitation hospitals, falls resulting in some injury range from 30% to 51% and falls resulting in fracture range from 1% to 3%.
- Falls are also associated with increased length of stay, an increased amount of health care resources and poorer health outcomes when specific fractures occur.
- Soft tissue injuries or minor fractures can also cause significant functional impairment, pain and distress. Even "minor" falls can prompt the older person to fear falling, causing him/her to limit activity, resulting in loss of strength and independence.

Suggested AIM:

- Reduce the number of preventable patient falls organization-wide by 50% by December 31, 2013.
- Decrease moderate to severe injuries from falls to 0.01 per 1000 patient days by December 31, 2013.

Potential Measures:

Outcome: Moderate-Severe Injuries from fall (rate per 1,000 discharges).

Number of patient falls, <u>with and without</u> injury to the patient, by type of unit during the calendar month x 1,000. *Process:* Percent fall risk assessments completed within 24 hours of admission.

Primary Drivers	Secondary Drivers
Fall and Injury Risk	✓ Conduct a fall risk assessment upon admission using a validated risk assessment
Assessment	✓ Assess pt.'s fall risk by asking the patient and family what they do outside the hospital to prevent falls
	✓ High-injury risk patients include ABCS – Age > 85, Bone, C anticoagulation, coagulopathies, Surgical pts.
Fall Risk	✓ Conduct ongoing reassessments including new and/or changed medications that increase fall risks
Reassessment	✓ Perform hourly or bi-hourly rounds to assess and address patient needs for Ps: pain, position, potty,
	personal belongings and safe pathway
Environmental	✓ Create a safe environment for patients by eliminating hazards and injury hazards (i.e. sharp edges)
Interventions	✓ Develop an equipment safety checklist; bathroom and shower safety devices
	✓ Consider flooring and lighting and The setup of the patient rooms: clutter free, furniture placement and
	the assessment of the patient's strongest side when getting out of bed, floor mats
Interventions for All	✓ Use visual/audible cues, e.g. colorful, easy to view alert wristbands, bedside risk signs, non-skid footwear
Patients	 Medication review – avoid unnecessary hypnotic/sedative medications
	✓ Use of beds that are lower / closer to the floor
	✓ Involve family and care givers in the care of the patient to prevent falls, e.g. sit with the patient during
	vulnerable times
	 Intermittent but regular observation through hourly "rounding" by staff
	 Patient education - emphasizing the positive benefits of interventions (enhancing independence and
	quality of life) rather than the negative (i.e., risk of falls)
	✓ Achieve interdisciplinary participation including nursing, medical staff, pharmacy, therapy staff,
	environmental services and engineering/maintenance
Individualized	✓ Increase the frequency of rounding
Interventions for	✓ Enhance environmental changes, e.g., move closer to nursing station
High Risk Patients	✓ Assistive devices (walking aids, transfer bars, bedside commodes, etc.) located on exit side of bed

Making Changes:

• This intervention is in the Collaborative with Reducing Pressure Ulcers and VTEs (PIVOT Collaborative). National meetings, webinars, bi-monthly coaching calls, change packages and other tools will augment state hospital association activities.

Key Resources:

- AHRQ An Evidence Based Handbook for Nurses <u>http://www.ahrq.gov/qual/nurseshdbk/</u>
- Department of Veteran Affairs Falls Prevention Toolkit <u>http://www.patientsafety.gov/safetytopics/fallstoolkit/index.html</u>
- Hospital Elder Life Program (HELP) <u>http://www.hospitalelderlifeprogram.org/</u>
- IHI How to Guide Reducing Injuries from Falls <u>http://www.ihi.org/knowledge/Pages/Tools/TCABHowToGuideReducingPatientInjuriesfromFalls.aspx</u>





Prevention of Falls with Injury Driver Diagram

2012-2013



AIM: Reduce the number of preventable patient falls, organization-wide by 50% by 12/31/13 AIM: Decrease moderate to severe injuries from falls to 0.01 per 1000 patient days by 12/31/13

Primary Drivers	Secondary Drivers	Change Ideas
Fall Risk Assessment	 Conduct a fall risk assessment upon admission using a validated risk assessment tool Include as part of fall assessment patient and family inquiry on level of mobility and fall prevention measures utilized at home Develop mobilization protocols that triggers a referral to PT and or OT 	 The most commonly used assessment is the Morse Falls Score with others including but not limited to, Conley, Hendrich II and, of course, the use of nursing judgment Use the ABCS Falls Assessment: Age, Bones, Coagulation and Surgery Orient patients to their surroundings Place fall risk on all hand-off communication forms and/or ticklers when giving a verbal handoff
Fall Risk Reassessment	 Conduct ongoing reassessments including new medication orders Monitor a patient's risk factors frequently Perform hourly or bi-hourly rounds to assess and address patient needs for the 3 "P's:" positioning, pain and potty 	 Instruct patients with medication time/dose, side effects and interactions with food or other medications Consider pharmacist review of medications when patient is at risk Determine time of day that everyone conducts the 3 "P's," using clear and loud announcements. Combine the rounds with other care related tasks, e.g. vital signs,
Environmental Interventions	 Create a safe environment for patients by eliminating hazards Develop an equipment safety checklist Involve facility management and housekeeping staff by developing a check list for environment and equipment safety 	 Individualize the room for that patient Bed assignment that allows patients to exit toward their stronger side Keep bedside table, call bell and light switch in reach of patient Well lit room Free of clutter Bathroom and exit doors are clearly marked Movable furniture is locked Use beds with adjustable heights Keep bed in a low position Facilities/EVS – engaged EVS staff as part of team to develop checklist. Checklist to include but not limited to: All lights are working properly Area clear of obstructions Floors are dry



Implementation Guide to Prevention of Falls with Injury 6

Primary Drivers	Secondary Drivers	Change Ideas
Customized Interventions for Dationts		 o Furniture is sturdy o Flooring is level and free of tripping hazards o Grab bars, depending on population, in toilet and shower o Electrical cords secured out of the way
	 Ose visual / Audible Cues Staff education - ensure staff is capable of performing a thorough fall assessment Medication Review - avoid unnecessary hypnotic/sedative medications Use of beds that are lower / closer to the floor except when standing or during transfer Involve family and care givers in the care of the patient to prevent falls Patient education - emphasizing the positive benefits of interventions (enhancing independence and quality of life) rather than the negative (i.e. risk of falls). Achieve multidisciplinary buy-in, including nursing, medical staff, pharmacy and therapy staff, and support staff responsible for housekeeping and building maintenance. 	 Ose coloridi, easy to view alert wristballids, bedside lisk signs, non-skid footwear and chart with fall risk sticker Have family/care giver sit with the patient during vulnerable times Intermittent but regular observation through hourly "rounding" by staff Use teach back methods for patients and their families Use staff lead group that it is multidisciplinary to address fall reduction. Should include nursing, PT, OT, and physician.
Individualized Interventions for Moderate/High Injury Risk Patients	 Increase the frequency of rounding Enhance environmental changes Develop a check list for high risk fall room set up Use of technology 	 Room located as close as possible to nursing station Non-slip/skid padded floor mat on the exit side of the bed Assistive devices (walking aids, transfer bars, bedside commodes, etc.) located on exit side of bed Night lights to ensure room is illuminated at all times Handrails are accessible and sturdy Individualized toileting schedule Hip protectors Balance/Strength assessments Audible bed and chair alarms, if available, are turned on



Prevention of Falls with Injury:

In hospitals and other health care facilities patient and family falls are among the most frequently reported incidents. Unlike some other types of adverse events, many inpatient falls cause little or no harm, but the high overall rate of falls means that they are a significant cause of hospital-acquired injury. Falls can sometimes lead to severe injuries, such as hip fractures and head trauma.

Immobility is a decrease in the amount of time spent up and moving (getting out of the bed or chair and walking, for example). Immobility causes loss of muscle strength along with changes in the cardiac response to exercise. Immobility in the hospital increases the chances of delirium, pressure ulcers, venous thromboembolism, falls and functional decline. Functional decline is the loss of the ability to perform activities that ensure a person's independence, such as walking, getting to the toilet, and dressing. Functional decline leads to increased lengths of hospitalization and readmission.

Goal: The Partnership for Patients estimates that 25% of fall injuries are preventable. The goal set for hospitals is to cut the number of preventable fall injuries in half while maintaining or increasing patients' mobility by 2013. Over three years, this would prevent a total of 43,750 fall injuries, while maintaining or increasing mobility.

While agreed-upon and evidence-based strategies for fall injury prevention in the hospital setting have been challenging to establish, the goal is to reduce fall injuries by encouraging safe mobility (getting up and walking) of patients. Efforts to reduce falls and fall injuries while increasing safe mobility focus on risk assessment followed by interdisciplinary and multi-component responses. Examples include adhering to bed rest orders; instituting a toileting schedule to assure that a patient has help walking to and from the bathroom at regular intervals; frequent walks; frequent reorientation if confused; providing a safe environment including good lighting, a bed that lowers to the floor, appropriate assistive devices and removing clutter; and reducing drugs that may cause dizziness, drowsiness, or confusion. Devices such as bed and chair alarms that alert staff to a patient's movement should be used only in combination with interdisciplinary and multi-component responses to avoid the consequences of immobility.¹

Suggested AIM Statements:

- Reduce the number of preventable patient falls, organization-wide by 50% by December 31, 2013
- Reduce the number of preventable patient falls to zero in more than 2 units for 6 consecutive months by December 31, 2013
- Reduce the number of patient falls with moderate to severe injuries, organization-wide by 25% December 31, 2013
- Decrease moderate to severe injuries from falls to 0.01 per 1000 patient days by December 31, 2013

Suggested Outcomes Measures:

- Number of preventable falls with and without injury to the patient, by type/location of nursing unit, during a calendar month
- Rate of moderate to severe injury from falls per 1000 discharges

Assess Risk for Falling and Risk for Serious Injury from a Fall

An accurate assessment of a patient's risk for falling and risk for injury from a fall is a crucial first step in preventing injuries. It also helps focus resources on those patients most likely to benefit from interventions. Developing a method for assessing risk is a key first step in every fall prevention program.



Secondary Driver: Perform a standardized fall risk assessment for all patients on admission and with every change in status

All patients who enter the organization must be assessed for risk of falling and risk of injury from falls. A validated, standardized assessment tool that can be used in a variety of patient settings, is simple to use and does not take a lot of time to complete is essential to this process. An assessment tool should identify and stratify the risk of falling for each assessed patient.

Change Ideas: Morse Fall Scale

- Trial a validated risk assessment tool that is already in existence, such as the Morse Fall Scale (See Appendix A), on a small number of patients.²,³,⁴
- ✓ Define as an organization when the Initial Fall Risk Assessment should be done.
- ✓ Define as an organization that is responsible for the Initial Fall Risk Assessment, preferably in an interdisciplinary process.

Suggested Process Measure

• Percentage of patients with a completed interdisciplinary fall risk assessment at admission

Secondary Driver: Identify those patients at high risk for injury from falls

Prevention of falls with injuries requires special consideration and assessment of patients at risk. Patients at the highest risk for injury if they sustain a fall are those over age 85 or frail due to a medical condition, have a history of orthopedic conditions or bleeding disorders and/or post-surgical patients. These are the ABCs of risk for injury (Age, Bones, Coagulation, Surgery) from a fall and represent an important subset of all falls. Focusing on all falls and ignoring the special risks for the ABCs population is a common mistake in falls with injury management.

Change Ideas: The ABCs of highest-risk patients

- ✓ Assess and re-assess fall risk status for the patients at the highest risk for injury from a fall at every shift
- ✓ Use a reminder such as "ABCs" at the beginning of each shift to identify those patients at highest risk for injury from a fall:
 - (A) Age or frailty
 - (B) Bones
 - (C) Coagulation
 - (D) (s) Surgery (recent)

Suggested Process Measures:

- Percentage of patients identified at highest risk for injury from a fall reassessed as per policy
- Percentage of high-risk patients correctly identified during initial fall risk assessment

"Hardwiring" Assess Risk for Falling and Risk for Serious Injury from a Fall as part of improvement plan:

Hardwiring methods include incorporating fall risk assessment in the admission assessment process and as part of the routine assessment process.⁵ The fall risk assessment tool should be part of that documentation. Another hardwiring method is to create and implement an admissions checklist to be used with each admission to help ensure that all elements fall risk assessment and prevention methods are completed.

Communicate and Educate About Patient's Fall and Injury Risk

Communication among all caregivers, as well as with the patient and family, is key to avoiding falls and reducing injuries related to falls. Use verbal and visual communication tools to educate and remind others of a patient's fall risk.

Secondary Driver: Communicate to all staff a patient's fall risk



Staff members who are aware of a patient's risk for falling will implement fall precautions appropriate for the patient's level of care.

Change Ideas: Communicate fall risk

- Use standardized visual cues to communicate fall risk to all care members.
 - 1. Place red colored non-skid socks on all patients at risk for falling.
 - 2. Colored wrist bands or colored blanket on the bed or on the patient's lap can also be used.
 - 3. Use signage in or outside the patient room to represent fall risk, being careful to maintain respect and dignity for the patient's privacy. (See Appendix D)
 - Some hospitals use a picture of a leaf on the door to represent a risk for falling, with a red leaf for risk of injury from falls.
 - Other hospitals simply use colored signs or other symbols to represent fall risk.
- ✓ Use standardized handoff communication between hospital staff members at change of shift or change in department.
 - 1. Add fall risk, risk for injury, history of falls, changes in fall risk and falls prevention measures for each patient in a handoff checklist that is standardized across the organization.

Suggested Process Measures:

- Percentage of patients identified as a fall risk with visual cues in place, as per hospital policy
- Percentage of handoffs that include a discussion about patient's fall risk, as observed or documented

Secondary Driver: Educate the patient and family members

Patients and family members who are aware of and understand the patient's risk for falling, and the strategies for preventing falls, can help to prevent injuries from falls. It is important to assess understanding of the education by patients and families of the precautionary measures to prevent falls.

Change Ideas: Strategies to strengthen education

- ✓ Use the "Teach Back" method⁶ when providing education about falls precautions including the reasons the patient is at risk for falling, precautions to be taken, reminder to use the call bell and ways to keep the patient safe
 - 1. After providing education, ask the patients and/or family members to restate in their own words the information that they heard during the education.
 - 2. If the patient and/or family member does not understand, provide additional teaching, followed by another opportunity to teach back.
- ✓ Determine who the learner(s) is/are. Address family members who are involved in care or regularly with the patient, with the patient's permission.

Suggested Process Measures:

• Percentage of falls education sessions which include the "Teach Back' method, as observed

"Hardwiring" Communicate and Educate about Patient's Fall Risk as part of the improvement plan:

Making the process as routine as possible will help to assure that all aspects of fall prevention are addressed reliably in every patient, every day. Make fall prevention a part of the everyday process of patient care.

- ✓ Use standardized handoff communication between hospital staff members at change of shift or change in department.
- ✓ Include fall fisk prevention as a routine part of multidisciplinary rounds.



Identify Modifiable Fall Risk Factors and Customize Interventions

Interventions for patients identified as at risk for falling and at high risk for injury from falling are essential to keep patients safe. Design interventions based on a comprehensive assessment for each patient and targeted to modifiable risk factors.

Secondary Driver: Implement environmental interventions to prevent falls

Create a safe environment by eliminating hazards.

Change Ideas: Reduce environmental hazards

- ✓ Develop an environmental safety checklist.
 - Designate a time of day for routine rounds using the checklist by a multi-disciplinary team that includes nursing staff, administrative team members, housekeeping staff and engineering staff to identify potential hazards. Collaborative rounds provide an opportunity for different perspectives to notice hazards such as uneven flooring and clutter, and lighting, grab bars or layout of the patient rooms.(See Appendix B)

Suggested Process Measures:

- Percentage of environmental rounds completed as determined by organization
- Percentage of time all required members of environmental rounds team present for scheduled rounds

Secondary Driver: Implement patient-specific interventions to prevent falls

Customize interventions based on assessment of risk and patient's medical and physical condition.

Change Ideas: Customized interventions

- ✓ Arrange the patient's room to eliminate safety risks. (See Appendix C)
 - 1. Make bed assignments that allow the patient to exit toward their strongest side.
 - 2. Keep bedside table, call bell and light switch in reach at all times.
 - 3. Ask the patient if the lighting in the room is adequate. If lighting is not adequate, provide extra lighting.
 - 4. Offer to move personal items such as pictures and other items out of the way of the patient, but still in sight, like on a counter.
 - 5. Keep the bed in the lowest possible position while the patient is resting and raise it to the appropriate level to stand or transfer.
 - 6. Ensure that any movable furniture is in a locked position during standing, transfer and other times as appropriate for the individual patient.
 - 7. Secure electrical cords for equipment out of the way and off the floor based on the specific needs of the patient.

Suggested Process Measure:

- Percentage of rooms for patients identified as high risk for falling found to have bed not in lowest position while patient resting.
- ✓ Include a review of the patient's medications in the assessment of fall risk and risk for injury from falls.
 - 1. Flag those patients identified as increased risks for falling and injury from falls for a review of medications by a pharmacist.
 - 2. Consider use of the Beers criteria⁷ for inappropriate medications in the elderly.



- 3. Ask the pharmacist to recommend alternatives to medications that may increase fall risk and place an alert in the medication system for care providers.
- 4. Develop a visual cue for the lowest possible bed position for high-risk falls patient.
- 5. Create a mechanism for regular (every 4 hours) monitoring for bed position appropriateness based on visual cues. Define when and who is responsible for monitoring bed position.

Suggested Process Measures:

- Percentage of patients identified as high risk for injury from falls receiving a medication review by pharmacist
- Percentage of medications that meet Beers criteria
- Percentage of medications changed after pharmacist review

Secondary Driver: Implement intentional rounding on patients

Perform hourly or bi-hourly comfort rounds on patients to address needs for pain control, positioning and elimination. Falls frequently occur when patients at risk for falling attempt to get out of bed to get to the restroom without assistance. Addressing this need frequently will allow the hospital to assist the patient safely to the restroom and back to bed.⁸

Change Ideas: Methods to standardize rounding

- ✓ Combine hourly or bi-hourly rounding with other patient care tasks, such as turning, pain assessment, or vital signs to be more effective.
- ✓ Assign specific staff members to the rounding to ensure responsibility is clear.
- ✓ Educate the patient that a staff member will be in the room every two hours to assist with the "P's" pain, position, potty, personal belongings, pathway

Suggested Process Measure:

• Percentage of patient rooms with documented rounding per hospital policy

"Hardwiring" Standardize Interventions for Patients at Risk for Falling as part of the improvement plan:

Standardizing where you do something each and every time is a method of hardwiring. Several of the interventions above promote hardwiring, such as:

- ✓ Combine hourly or bi-hourly rounding with other patient care tasks, such as turning, pain assessment, or vital signs to be more effective.
- ✓ Assign specific staff members to the rounding to ensure responsibility is clear.
- ✓ Educate the patient that a staff member will be in the room every two hours to assist with the "3 P's" pain, position and potty.

Customize Interventions for Moderate/High Injury Related Risk Patients

Patients identified as moderate to highest risk for a serious injury from a fall require more intensive precautions to maintain safety. In addition to a standardized process for all patients, addressing special or unique issues with these patients is crucial to hitting your AIM.

Secondary Driver: Increase intensity and frequency of observation

Patients at high risk for injury require more frequent observation than those patients assigned to standard fall precautions.

Change Ideas: Enhancing direct patient observation

✓ Encourage family members to stay with the patient whenever possible.



- Place high risk patients in rooms that are closer and more visible to hospital staff, ideally in a direct line of sight.
- ✓ Round in the patient's room more frequently than the hourly or bi-hourly rounds.
- ✓ Develop an individualized toileting schedule for the patient.

Suggested Process Measures:

- Percentage of high risk patients in rooms designated for falls risk
- Percentage of documented rounding at frequency determined by facility

Secondary Driver: Make environmental adaptations and provide personal devices to reduce risk of fallrelated injury

Environmental adaptations can provide protection from falls and reduce the risk of injury from falls. In some cases, more intense or individualized adaptations are required based on a patient's risk, specific needs or progress with treatment.

Change Ideas: Customized environmental changes

- \checkmark Place a non-slip padded floor mat next to the bed.
- ✓ Place assistive devices (walking aids, transfer bars, bedside commodes) on the exit side of the bed.
- ✓ Use night lights to ensure the room is illuminated at all times.
- ✓ Use bed or chair alarms to alert staff quickly to patient movement.
- ✓ Keep the bed at its lowest possible height.
- ✓ Use gait belts when ambulating the patient.

Suggested Process Measures:

• Percentage rooms identified on environmental rounds as not meeting requirements for high risk patients

Secondary Driver: Target interventions to reduce the side effects of medications

Many medications increase the risk for falling and the risk for injury as the result of a fall. Especially in the elderly, polypharmacy is common and contributes to many adverse events including falls and falls with injury.

Change Ideas: Safer medication management

- Review patient's medication lists with prescribing providers and pharmacy to eliminate or replace any medications that would increase the risk for falling, if possible.
- \checkmark Consider use of the Beers criteria⁹ for inappropriate medications in the elderly.
- ✓ Ask the pharmacist to recommend alternatives to medications that may increase fall risk and to place an alert in the medication system for care providers.

Suggested Process Measures:

- Percentage of high risk patients receiving a review of medications by a pharmacist
- Percentage of medications that meet Beers criteria
- Percentage of medications changed after pharmacist review

"Hardwiring" Customized Interventions for Patients at Highest Risk of a Serious or Major Injury from a Fall as part of the improvement plan:

In order to customize prevention methodologies for the highest risk patients, assessment of risk has to be routine. If risk goes unassessed then the chance of appropriate precautions taken is low. As stated earlier, assessments should be done on admission, every day if not every shift, and on change of status. Once the assessment is complete, the findings of the assessment should generate an automatic intervention and needed referrals.



Potential Barriers:

Implementation of falls prevention efforts may spur resistance for staff due to a perceived increase in work load. To help mitigate, demonstrate return on the work invested, and educate staff about how patient safety and falls prevention protocols have been shown to decrease falls.

Staff may experience the feelings of powerlessness and resentment to a "do this, do that" approach.

 Including key stakeholders such as bedside nurses, physicians, and nurses' aides, and environmental services in the improvement team to develop protocols, work flows and conduct peer to peer education has been shown to be effective in successfully implementing best practices.^{10,11}

Leadership may underappreciate the impact of falls on workload and risk management. The acuity of high-risk patients doesn't always match the work requirements to implement safe practices. Staffing patterns may need to be evaluated with a fully implemented program to address the ABCs population, in particular. Units may be closed for budget purposes, putting high-risk falls patients further from line of sight. Falls with moderate to severe injury may have an impact on risk management costs and including those responsible in the discussion may help place the appropriate attention on the problem.

Using administrative leadership sponsorship to help remove or mitigate barriers

- A management executive sponsor, recognizing the value to the patients and the value to the organization of preventing falls, can help brainstorm solutions to what may appear to be added work, or provide resources to mitigate that additional work. An executive sponsor can also help to see the "big picture" on how this may impact the organization as a whole, and champions through requests for workflow change or supplies. Executive sponsors can help educate, lead, and provide solutions to staffing barriers.
- Start with one unit and refine the process until it is a reliable process and has demonstrated some success in fall reduction. You may need to start with just one nurse champion to use protocols and refine.

This is not just a change in practice but may also be a change in culture

• This is an example of an innovation that will require small tests of change and planned spread driven by success. The ideal end result is the development of team-based care where each member of the team (physician, nurse, respiratory therapist) contributes to better and safer patient care.

Tips on Using the Model for Improvement:

Assess risk for falling and risk for serious injury from falls:

- Ask one nurse to pilot test a fall risk assessment on one patient, and then work with that nurse to improve the assessment for the next patient.
- Remember that a small pilot test can be just that small. Start with one patient, one physician, and one nurse. Don't wait for approval from all departments. The results of multiple small tests of change will ultimately guide successful implementation.
- Add the ABCs information to an existing handoff communication tool. Ask one nurse to help you improve the process of communicating risk for serious injury from falls in a manner that makes the most sense to those who will be doing the communication – format a handoff tool, prompts in an electronic assessment screen, visual cues.

Communicate and educate about patient's fall risk:

 Designate one person (a charge nurse, nurse aide, administrative person) to do unscheduled environmental rounds to test if visual cues are present for those patients identified as fall risks. Measure compliance with the visual cues – falling star sign on the door to the room, red socks on the patient's feet, red blanket across the patient's lap, etc.



• If compliance with the visual cues is not as expected, ask a few of the team members responsible for implementing the process to help drill down the reasons for non-compliance. Oftentimes, non-compliance is not due to forgetfulness, but to deficiencies in supplies or communication.

Standardize interventions for patients at risk for falling:

- Successful implementation of standardized rounding will require buy-in from nursing staff. Find an initiative "champion" among nurses who is respected by his/her peers to help educate the staff about the expected benefits of standardized rounding.
- Work with nurses and nurse aides to develop a schedule for rounding that makes the best use of time for all team members. Schedule rounds around tasks that will require staff to be in the patient room already, such as medication administration, vital signs, etc.
- Designate who on the treatment team is responsible for the rounds.
- Trial the rounding on a few patients with just one nurse to start and improve the process immediately based on feedback.

Customize interventions for high risk patients

- Ask a pharmacist to help you design a process for medication review that includes how the pharmacy will be notified of a high-risk patient and how pharmacy will communicate the results of the review to the physician and nurse.
- Trial the process on one patient, and huddle afterwards to see how the process can be improved. Try the improved process on the next patient and incrementally increase the number of patients to be reviewed, each time huddling afterward for a few minutes to rapidly debrief what worked well and what did not work well.
- Voluntary participation through the method of "asking for help improving, not approving" will often generate momentum and rapid improvement of the process. A good question is "what do we need to do to make this work here?" rather than "can we make this work here?"



Key Resources:

Boushon B, Nielsen G, Quigley P, Rutherford P, Taylor J, Shannon D. *Transforming Care at the Bedside How-to Guide: Reducing Patient Injuries from Falls*. Cambridge, MA: Institute for Healthcare Improvement; 2008. Available at: <u>http://www.IHI.org</u>.

ECRI Falls Prevention Resources http://www.ecri.org/falls

VA National Patient Safety Center Falls Prevention Toolkit http://www.patientsafety.gov/SafetyTopics/fallstoolkit/index.html

Massachusetts Hospitals http://www.patientsfirstma.org/index.cfm

Joint Commission Resources, *Good Practices in Preventing Patient Falls* <u>http://www.jcrinc.com/Preventing-Patient-</u> <u>Falls/</u>

Institute for Clinical Systems Improvement, Health Care Protocol: Prevention of Falls (Acute Care) www.icsi.org



Appendix I: Morse Fall Scale

• Morse Fall Scale:

 History of falling; immediate or within months 		No = 0 Yes = 25			
2. Secondary diagnosis		No = 0 Yes = 15			
3. Ambulatory aid		None, bed rest, wheel chair Crutches, cane, walker = 1 Furniture = 30	None, bed rest, wheel chair, nurse = 0 Crutches, cane, walker = 15 Furniture = 30		
4. IV/Heparin Lock		No = 0 Yes = 20	No = 0 Yes = 20		
5. Gait/Transferring		Normal, bed rest, immobile = 0 Weak = 10 Impaired = 20			
6. Mental status		Oriented to own ability = 0 Forgets limitations = 15			
Risk Level	MFS	Score	Action		
No Risk	0 - 24		None		
Low Risk	25 - 4	4	See Standard Fall Prevention Interventions		
High Risk	>45		See Moderate/High Risk Fall Prevention Interventions		

Morse, J. (1997). Preventing falls. Thousands Oaks: Sage Publication.



Appendix II: Environmental Fall Risk Assessment Sample

Environmental Fall Risk Assessment

Date:	Hospital	Unit:
Rooms assessed:		
(Minimum of 10% of rooms)		
Individual(s) Surveying:		

Item	Environmental Consideration	Yes	No	N/A	Room # /	Comments
#					area	
					deficiencies	
PATI	ENT ROOM				Touriu	
1	Is there adequate lighting in the patient's room?	[1			
-	(Bright light – no burned out bulbs?)					
2	Is the nightlight on the patient's bed functional /					
	operating?					
3	Does the patient have an unobstructed path to the					
	bathroom?					
4	Are patient room furnishings safely arranged?					
5	Is bedside furniture free of sharp edges?					
6	Is the bedside furniture sturdy?					
7	Are beds /stretchers kept at lowest setting whenever					
	possible?					
8	Are beds/ stretchers kept in locked position?					
9	Were the upper side rails in the up position for patient					
	to reach controls?					
10	Was the bed check system on in the patient's room?					
11	Were the patient's personal belongings / telephone					
	call bell within reach?					
12	Are handrails provided in patient bathroom and					
	properly secured?					
13	Emergency call button / cord in patient care bathroom					
-	present and works properly?					
14	14 Are nonslip surfaces provided in patient showers?					
15	Are the door openings into the patient bathroom wide					
	enough for an assistive device to fit through?					
16	Are door openings flush with the floor for ease of					
FOU	DNAFNIT	I			I	
EQUI	PIVIENI		1	1		[
17	Portable equipment pushed by patient (i.e. IV pole)					
	sturdy and in good repair?					
18	Are bedside commodes available on the unit and have					
10	proper rubber slip tips on the legs?					
19	Do walkers / canes / crutches have the appropriate					
20	silp tips?					
20	Are wheelchairs locked when stationary:			-		
		1			l	
OTH	ER ENVIRONMENTAL CONSIDERATIONS	1		1	[
22	Are floor surfaces/carpeting free of cracks and tripping hazards?					
23	Are hallways kept adequately clear / clutter free to allow patient ambulation?					
24	Are floors properly marked when wet to avoid slipping					
	or spill cleaned up immediately?					
25	Do parking lots have uneven pavement / potholes /					
	tripping hazards?					



26	Do sidewalks have uneven pavement / tripping hazards?			
27	Entrance areas free and clear?			
28	Parking areas / entrances well – lit?			
29	Parking lots well marked?			

ENVIRONMENTAL FALL RISK ASSESSMENT FOLLOW-UP

ITEM #	CORRECTIVE ACTION	DATE INITIATED	RESPONSIBLE INDIVIDUAL(S)	ANTICIPATED DATE OF COMPLETION

Boushon B, Nielsen G, Quigley P, Rutherford P, Taylor J, Shannon D. *Transforming Care at the Bedside How-to Guide: Reducing Patient Injuries from Falls*. Cambridge, MA: Institute for Healthcare Improvement; 2008. Available at: <u>http://www.IHI.org</u>.



Appendix III: Environmental precautions in the patient room

Veterans Administration National Falls Toolkit, National Center for Patient Safety <u>http://www.patientsafety.gov/SafetyTopics/fallstoolkit/notebook/06_interventions.pdf</u> (page 3)¹²



Non-slip floor mat absorbs fluids, food, & stool, and prevents slips



Appendix IV: Visual Cue Fall Risk Examples



Catch a Falling Star Program: falling star on door to patient room, yellow armband on patient, non-skid slipper socks on patients.



Ruby Slippers Program: Ruby Slippers or Red Star sign on door to patient room, red non-skid slipper socks on patient's feet, red stickers on front of chart/cardex, special ruby slipper marker on patient's census board.

CAUTION

SAFE Program: "Stay Alert for Falls Event": yellow SAFE sign on door, yellow armband on patient, non-skid slipper socks on patient.



LAMP Program: "Look at Me Please": yellow lamp sign on door, yellow armband on patient, non-skid slipper socks on patient.



IRIS Program: "I Require Intensive Surveillance:" Sign on door, pink armband in place, non-skid

slipper socks on patient.

Visual Cues Program from The Joint Commission Journal on Quality and Patient Safety July 2007 (Lancaster, 2007 [D])



Endnotes:

¹ http://www.healthcare.gov/compare/partnership-for-patients/resources/index.html

² Conley D, Schultz A, Selrin R. The challenge of predicting patients at risk for falling: Development of the Conley Scale. *MEDSURG Nursing*. 1999;8(6):348-354.

³ Hendrich A, Bender P, Nyhuis A. Validation of the Hendrich II Fall Risk Model: A large concurrent case/control study of hospitalized patients. *Applied Nursing Research*. 2003 Feb;16(1):9-21.

⁴ Morse JM, Morse R, Tylko S. Development of a scale to identify the fall-prone patient. *Canadian Journal on Aging.* 1989;8:366-377.

⁶ Teach Back use by Transitions Home innovation units. Institute for Healthcare Improvement. *Good Heart Failure Care Follows Patients Home*. Available at:

http://www.ihi.org/IHI/Topics/ChronicConditions/AllConditions/ImprovementStories/GoodHeartFailureCareFollowsPatientsHome.htm.

⁷ The American Geriatric Society list of inappropriate medications for elderly patients – the Beers Criteria <u>http://www.americangeriatrics.org/health_care_professionals/clinical_practice/clinical_guidelines_recommendations/2012</u>)

⁸ Lancaster AD, Ayers A, Belbot B, et al. Preventing falls and eliminating injury at Ascension Health. *The Joint Commission Journal on Quality and Patient Safety.* 2007;33(7):367-375.

⁹ The American Geriatric Society list of inappropriate medications for elderly patients – the Beers Criteria http://www.americangeriatrics.org/health_care_professionals/clinical_practice/clinical_guidelines_recommendations/2012)

¹⁰ McDonald S, Tullai-McGuinness S, Madigan E, Shiverly M. Relationship between staff nurse involvement in organizational structures and perception of empowerment. Crt Care Nurs Q. 2010;33(2):148-162.

¹¹ Brody, AA. Barnes K, Ruble C, Sakowski J. Evidence-based practice councils: Potential path to staff nurse empowerment and leadership growth. JONA. 2012;42(1):28-33.

¹² National Falls Toolkit (2004). National Center for Patient Safety.

http://www.patientsafety.gov/SafetyTopics/fallstoolkit/index.html





Implementation Guide to Prevention of Hospital Acquired Pressure Ulcers (HAPU)

HRET Contact <u>hen@aha.org</u> (312) 834-7056 <u>www.hret-hen.org</u>



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Hospital-Acquired Pressure Ulcer Prevention Overview

Background:

- Pressure ulcers can cause harm to patients, causing pain, infections and extended lengths of stay.
- Hospital-acquired pressure ulcers in the United States were estimated to cost \$2.2 \$3.6 billion/year in 1999. In addition, significant personal burdens such as a decrease in quality of life, psychological and social implications occur.
- Prevalence of Stage II or greater pressure ulcers in the acute care setting range from 8.7% to 14.1% and incident rates range from 5% to 9% in the same setting.

Suggested AIMs:

- Reduce the prevalence of hospital acquired Stage II or greater pressure ulcers by 50% by December 31, 2013.
- Reduce the incidence of significant hospital acquired Stage III-IV pressure ulcers by 50% by December 31, 2013.

Potential Measures:

the day of the prevalence study

Outcome:

Process:

Skin assessment documented within 4 hours of admission and daily thereafter

Patients with significant (Stages III & IV) hospital acquired pressure ulcers - (rate per 1,000 discharges)

Percent of patients with at least one Stage II or greater hospital acquired (not present on admission) pressure ulcer on

Pressure ulcer risk assessment completed within 24 hours of admission and daily thereafter Compliance with prevention interventions for patients at risk for skin breakdown

Primary Drivers	Secondary Drivers
Conduct Skin / Risk	✓ Use a head-to-toe skin and risk assessment as soon as possible, within 4 hours upon admission to the
Assessment &	hospital.
Reassessment	 Utilize a validated standard tool for the skin and risk assessment.
	✓ The risk and skin assessment should be age appropriate. Pediatric versus adult.
	✓ Skin Assessment and reassessment of risk daily or more frequently for high-risk patients.
Manage Moisture	✓ Keep the patient dry and moisturize the skin only if necessary.
	✓ When necessary, use under-pads that wick moisture away from skin and provide a quick-drying
	surface.
	\checkmark Set specific time frames to remind staff to reposition, offer toileting often, PO fluids, reassess for wet
	skin, e.g. P's – Pain/Potty/Position/Pressure.
	✓ Keep supplies handy at the bedside in the event the patient is incontinent.
Optimize Hydration	✓ Give patients preferences to encourage hydration and nutrition.
and Nutrition	✓ Provide at risk patients with a different color water container so all staff and families will know to
	encourage hydration.
	✓ Provide nutritional supplements if not contraindicated
	✓ Consult a registered dietician if the patient is at a high risk.
	✓ Assess weight status, food and fluid intake, hydration status and laboratory data.
Minimize Pressure	\checkmark Turn and reposition patients every two hours using visual or musical cues, bells and alarms at the
	nurses' station.
	✓ Use special beds, mattresses, pillows and blankets to redistribute the potential pressure areas.
	✓ Use the NPUAP guidelines for alignment.
	✓ Use lifting devices to prevent shearing or friction.

Making Changes:

• This intervention is in the <u>Collaborative with Reducing Pressure Ulcers and VTEs (**PIVOT Collaborative**)</u>. National meetings, webinars, monthly coaching calls, change packages and other tools will augment state association activities.

Key Resources:

- AHRQ Toolkit Preventing Pressure Ulcers in Hospitals: <u>http://www.ahrq.gov/research/ltc/pressureulcertoolkit/</u>
- AHRQ Guideline Synthesis on Preventing Pressure Ulcers: <u>http://www.guideline.gov/syntheses/synthesis.aspx?id=25078</u>
- National Pressure Ulcer Advisory Panel: <u>http://www.npaup.org/</u>
- IHI <u>How to Guide</u> Reducing Pressure Ulcers



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Hospital Acquired Pressure Ulcers Driver Diagram

2012-2013



Primary Drivers	Secondary Drivers	Change Ideas
Conduct Skin / Risk Assessment & Reassessment	 Adopt a head-to-toe skin and risk assessment tool 	 Utilize a validated standard tool for the skin and risk assessment. Assess skin and risk within four hours of admission. Assess skin at least daily and during routine assessment. The risk and skin assessment should be age appropriate. Pediatric versus adult. Visual cues should be available to ensure the completion of the assessment. Use multiple methods to visually identify patients at risk. Use visual cues in the patient's room, door, or front of the medical record, etc. Reassess risk for HAPU at a minimum daily. Develop documentation tools to prompt daily skin inspections. Develop an individualized plan of care to reduce the risks of pressure ulcers. Use cameras to photograph and document present-on-admission skin issues. Conduct nurse-to-nurse shift reports at bedside to include skin assessment with two sets of eyes (to improve accuracy of skin assessment and documentation).
Manage Moisture	 Keep skin dry and hydrated. Sequence implementation by drug class 	 Use topical agents that hydrate the skin and form a moisture barrier to reduce skin damage. Set specific time frames or create reminder systems to reposition; offer toileting often, PO fluids, reassess for wet skin. e.g. 3 P's – Pain/Potty/Position-Pressure Involve licensed and unlicensed staff such as nurse aids in every hour rounding/3 P's Consider Stage I pressure ulcer as a "vital sign." Use under-pads that wick moisture away from skin and provide a quick-drying surface. Keep supplies readily available at the bedside in the event the patient is incontinent. Develop a skin-care cart with supplies and a guide for how to manage skin issues according to degree. Combine routine activities, such as a protocol or guideline. Identify a staff nurse for each unit as a skin care resource. Avoid using a thick paste as a cleansing/moisture barrier (staff tend to clean the paste when stool is present resulting in skin injury as the paste is not easily removed). ANTICOAGULANTS: Use protocol to discontinue or restart warfarin perioperatively.



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FOR PATIENTS HealthCare.gov

Primary Drivers	Secondary Drivers	Change Ideas
Optimize Hydration and	 Assess weight, nutrition and hydration status 	 Give patients food/liquid preferences to enhance hydration and nutrition. Provide nutritional supplements if not contraindicated
NULTION	Status	 Create an automatic registered dietician consult if the patient is at high risk.
		✓ Assess weight, food and fluid intake and laboratory data.
		✓ Provide at risk patients with a different color water container so all staff and families will
		know to encourage hydration.
		✓ Assist the patient with meals and encourage snacks.
		✓ Offer water to the patient when rounding for the 3 "P's". Pain/Potty/Position
Minimize Pressure	• Turn and reposition patients every two	✓ Use visual or musical cues, e.g. a turning clock, bells, and alarms, at the nurse's station
	hours.	as a reminder to turn and reposition the patient.
	• Develop and institute early	✓ Use visual cues at the bed side to turn the patient, e.g. a turning clock or white board
	mobility/ambulation protocols	that has the time for the next turn.
		✓ Establish 'rules' for which side patients should be on at certain times (e.g. even hours on right side, odd hours on left side)
		Ensure proscure reducing equipment is available at all times (nillows hods heal
		protectors, foam wedges for positioning, etc.)
		\checkmark Use device that elevates the heel and prevents external rotation.
		✓ Use special beds, mattresses, pillows and blankets to redistribute the potential pressure
		areas.
		\checkmark Use the NPUAP ¹ guidelines for organizational alignment.
		✓ Use breathable glide sheets that can stay in place.
		✓ Use lifting devices to prevent shearing or friction.
		✓ Use ceiling lifts to encourage mobility and movement while preventing work-related
		injuries.
		\checkmark Limit layers of linen to no more than three (greater than four has been shown to be an
		independent risk factor for HAPU).

Implementation Guide to Prevention of Hospital Acquired Pressure Ulcers (HAPU) 5



¹ National Pressure Ulcer Advisory Panel (NPUAP). <u>http://www.npaup.org/</u>

Prevention of Hospital Acquired Pressure Ulcers (HAPU)

Between one and three million people in the US develop a HAPU every year (1998). More than 2.5 million patients in U.S. acute-care facilities suffer from pressure ulcers and 60, 000 die from pressure ulcer complications each year (2009). Hospital acquired pressure ulcers reduce overall quality of life due to pain, treatments and increased length of institutional stay, and may also contribute to premature mortality in some patients. Interventions that may help prevent pressure ulcers or to treat them once they occur lead to reduction of cost of HAPU care and improve the quality of life for those affected.

Suggested AIMs

Before the implementation of the improvement work starts, the team must have a goal at which to aim. An AIM statement for HAPU reduction efforts could include one of the following:

- Reduce the prevalence of Stage II or greater Hospital Acquired Pressure Ulcers (HAPU) by 50% by December 31, 2013
- Reduce the incidence of significant hospital acquired Stage III-IV pressure ulcers by 50% by December 31, 2013

Conduct Skin / Risk Assessment & Reassessment

Preventing pressure ulcers must start with assessing a patient's skin and a patient's risk for pressure ulcers. This assessment must be done upon admission and then at least daily during a patient's stay.¹ Risks for pressure ulcers include age, immobility, incontinence, inadequate nutrition and hydration, sensor deficiency, device related pressure, multiple co-morbidities, and circulatory abnormalities.²

Secondary Driver: Adopt a head-to-toe skin and risk assessment tool

In order to adequately assess a patient's skin and risk, the use of an accurate tool will allow the care team to implement timely prevention strategies for that patient.

Change Ideas: Skin Assessment Strategies

- ✓ Utilize a validated standard tool for the skin and risk assessment. The most widely used is the Braden Scale; however, there are others that may assist: Norton, Gosnell, Knoll, and Waterlow Scale.³
- ✓ Assess skin and risk within four hours of admission.
- ✓ Assess skin at least daily and during routine assessment.⁴
- ✓ The risk and skin assessment should be age appropriate. Pediatric versus adult.⁵
- ✓ Visual cues should be available to ensure the completion of the assessment.
- ✓ Use multiple methods to visually identify patients at risk. Use visual cues in the patient's room, on the door, or on the front of the medical record, etc.⁶
- Reassess risk for HAPU daily at a minimum. Develop documentation tools to prompt daily skin inspections. In acutely ill hospitalized patients, patient status and skin condition can change rapidly.
- ✓ Develop an individualized plan of care to reduce the risks of pressure ulcers.
- ✓ Use cameras to photograph and document present-on-admission skin issues.
- ✓ Conduct nurse-to-nurse shift reports at bedside to include skin assessment with two sets of eyes to improve accuracy of skin assessment and documentation.

Suggested Process Measure

Monthly audit for percentage of skin and risk assessment compliance on admission Monthly audit for percentage of daily reassessment compliance

"Hardwiring" Skin / Risk assessment and reassessment as part of improvement plan:

Hardwiring methods include incorporating skin and risk assessment in the admission assessment process and as part of the routine assessment process.⁷ The skin and risk assessment tool should be part of that documentation.



Another hardwiring method is to create and implement an admissions checklist to be used with each admission to help ensure that all elements including skin and risk assessment are completed.

Manage Moisture

Dry and optimally moisturized skin has a lower risk of developing pressure ulcers.⁸

Secondary Driver: Keep skin dry and hydrated

Part of the prevention measures of HAPU should include methods to limit skin's exposure to moisture from sources such as incontinence, drainage from wounds, or perspiration. Some methods to control the effects of moisture on the skin include the use of under pads that wick away moisture and present a dry surface to skin.⁹ Topical agents are available that provide both a moisture barrier and moisturize the skin.¹⁰

Change Ideas: Reliable Moisture Management

- ✓ Use topical agents that hydrate the skin and form a moisture barrier to reduce skin damage.
- ✓ Set specific time frames or create reminder systems to reposition, offer toileting often, PO fluids, reassess for wet skin, e.g. 3 P's Pain/Potty/Position-Pressure
- ✓ Involve licensed and unlicensed staff such as nurse aids in every hour rounding/3 P's.
- ✓ Consider Stage I pressure ulcer as a "vital sign."
- ✓ Use under-pads that wick moisture away from skin and provide a quick-drying surface.
- ✓ Keep supplies readily available at the bedside in the event the patient is incontinent.¹¹
- ✓ Develop a skin-care cart with supplies and a guide for how to manage skin issues according to degree.
- ✓ Combine routine activities, such as a protocol or guideline.
- ✓ Identify a staff nurse for each unit as a skin care resource.
- ✓ Avoid using a thick paste as a cleansing/moisture barrier (staff tend to use the paste when stool is present resulting in skin injury as the paste is not easily removed.)

Suggested Process Measure

- Audit compliance with hourly rounding and 3P's through random spot checks
- Random spot checks for percent of rooms with supplies available for incontinent patients

"Hardwiring" Moisture Management as part of improvement plan:

Making skin care and HAPU prevention part of the everyday practice and duties of staff is a reliable hardwiring tactic. Design a process for periodic activities completed by nursing staff such as hourly rounding, repositioning, assessing for wet skin, applying barrier agents, offering toileting opportunity and oral fluids such as water. By combining routine activities performed by both licensed and non-licensed nursing staff into a protocol, staff can complete multiple tasks while in the room every two hours and document all interventions at once.¹²

Optimize Hydration and Nutrition

Nutrition and hydration status affects skin condition and risk for pressure ulcer. It has been found that patients who have nutritional deficits may be twice as likely to develop skin breakdown¹³. Risk assessment for pressure ulcer development should include review of a patient's nutrition and hydration status.

Secondary Driver: Assess weight, nutrition and hydration status

Patients who are found to have nutritional intake and hydration deficits frequently have muscle mass loss and weight loss. This loss makes bones more prominent and makes patient's mobility difficult. Poor nutrition and hydration may cause edema and reduced blood flow to the skin which in turn causes ischemic damage, which all contribute to skin breakdown.^{14,15,16}

Change Ideas: Strengthen Metabolic Status

- ✓ Give patients food/liquid preferences to enhance hydration and nutrition.
- ✓ Provide nutritional supplements if not contraindicated.


- ✓ Create an automatic registered dietician consult if the patient is assessed as high risk.
- ✓ Consider standardized process to draw a prealbumin level in high risk patients or for high risk and medical conditions.
- ✓ Assess weight, food and fluid intake and laboratory data.
- ✓ Provide at risk patients with a different color water container so all staff and families will know to encourage hydration.
- ✓ Assist the patient with meals and encourage snacks.
- ✓ Offer water to the patient when rounding for the 3 "P's:" Pain/Potty/Position.

Suggested Process Measure

 Monthly audit of percentage of high risk patients receiving full pressure ulcer preventative care (daily skin assessment, moisture management, nutrition and hydration optimization, repositioning, use of pressureredistribution surfaces)¹⁷

"Hardwiring" Hydration and Nutrition Optimization as part of improvement plan

To hardwire hydration and nutrition, make the process of assessing patient's nutrition and hydration status as routine as possible, such as part of admission assessment and daily assessment of risk.

✓ Once a patient is assessed at high risk for pressure ulcer, a system should be in place to create an automatic registered dietician consult.

Minimize Pressure

Minimizing the amount of pressure on bony prominences will help to reduce the possibility of skin breakdown. By repositioning and utilizing pressure-redistribution surfaces, pressure on the skin will be redistributed^{18,19}. This is especially important - critical for patients with limited mobility as they are at high risk for developing pressure ulcers.²⁰

Secondary Driver: Turn and reposition patients every two hours

Turning and repositioning a patient helps to redistribute pressure on skin surface. This helps to maintain circulation to tissue in areas at risk for pressure ulcers.²¹ So, why every two hours? The literature does not provide clear guidelines for turning frequency; however, it is known that one-and-one-half to two hours in a single position is the maximum amount of time recommended for patients who have normal circulatory function.²²

Change Ideas: Methods to Reduce Pressure

- ✓ Repositioning, use of pressure-redistribution surfaces.²³
- ✓ Use visual or musical cues, e.g. a turning clock, bells, and alarms, at the nurses' station as a reminder to turn and reposition the patient.²⁴
- ✓ Use visual clues at the bed side to turn the patient, e.g. a turning clock or white board that has the time for the next turn.
- Establish 'rules' for which side should be down at certain items (e.g. even hours on the right side, odd hours on the left side.)
- Ensure pressure-reducing equipment is available at all times (pillows, beds, heel protectors, foam wedges for positioning, etc.)
- ✓ Use device that elevates the heel and prevents external rotation.
- ✓ Use special beds, mattresses, pillows and blankets to redistribute the potential pressure areas. ²⁵
- ✓ Operating room tables should have special overlay mattresses.^{26 27}
- ✓ Use the NPUAP guidelines for organizational alignment.²⁸
- ✓ Use breathable glide sheets that can stay in place.
- ✓ Use lifting devices to prevent shearing or friction.
- ✓ Use ceiling lifts to encourage mobility and movement while preventing work-related injuries.



✓ Limit layers of linen to no more than three (greater than four has been shown to be an independent risk factor for HAPU.)

Suggested Process Measure

Monthly audit of percentage of high risk patients receiving full pressure ulcer preventative care (daily skin assessment, moisture management, nutrition and hydration optimization)

Secondary Driver: Develop and institute early mobility/ambulation protocols

Reduced mobility is a risk factor for the development of pressure ulcers. Putting a process into place that assesses a patient's mobility and generates recommendations for physical therapy referral will enable staff to safely mobilize patients. Nurse driven mobility protocols have been demonstrated to be effective in reducing immobility related complications and reducing length of stay.^{29,30}

"Hardwiring" Minimizing Pressure as part of improvement plan

Hardwiring pressure minimizing strategies are similar to the other hardwiring strategies stated earlier. Making the process as routine as possible will help to ensure that all aspects of HAPU prevention are addressed reliably in every patient, every day. Make HAPU prevention a part of the everyday process of patient care. Design a process for skin and risk assessment, interventions such as repositioning, managing moisture, use of barrier agents, offering toileting and oral fluids, nutrition and hydration assessment and mobility assessment that will be utilized with every patient. A protocol will also identify those patients at high risk who require greater interventions such as registered dietician and physical therapy consults, and items such as pressure relieving surfaces.

Potential Barriers

- Recognize that for many physicians this will be a change in their practice.
 - Although pressure ulcers are a "nursing sensitive condition," physician participation can support improvement activities, build momentum and help address medical staff concerns.
 - Traditionally, any consults to other clinicians was a function of the physician, not an intradependent function with non-physician staff. Include lead physicians in the improvement team. Select these leads to work as champions to dialogue with physician colleagues and accelerate adoption.
 - Order sets and protocols may be seen by some physicians as "cookbook" medicine. It is actually "best recipe" medicine that uses what is known in the literature to provide the best opportunity for patients based on their individual needs to receive the care that will reduce their risk for HAPU.
- These processes may be new territory for many physicians, nurses, physical therapists, and registered dieticians. Nurses may be concerned that they may make a mistake, that they are not adequately trained to follow the policy, or that the medical staff will not be receptive and may become angry. Education of all parties, both about the risk of delayed intervention coupled with the efficacy of immediate intervention, will help mitigate this.

Using administrative leadership sponsorship to help remove or mitigate barriers:

- A management executive sponsor, recognizing the value of preventing HAPU to the patients and
 organization, can help brainstorm solutions to what may appear to be added work, or provide resources to
 mitigate that additional work. An executive sponsor can also help to see the "big picture" on how this may
 impact organization-wide, and champions through requests for workflow change or supplies. Executive
 sponsors can help educate, lead, and provide solutions to staffing barriers.
- A respected physician is crucial to accomplishing the goal of organization-wide adoption of best practices



protocols. The unit that you decide to first trial this change should be in an area where the initiative is supported by a respected physician leader. You can work on this intervention without a physician champion, but it will be slower.

- Senior physician, senior nursing, and senior pharmacy management will be critical to the success of new innovations like we have discussed in the section. These may be perceived as something punitive (timeliness audits), something new and unfamiliar (consult a pharmacist?) or additional work (cover the floors too?)
- Start with one unit and refine the process until it is a reliable process and has demonstrated some success in HAPU reduction and no harm. You may need to start with just one physician champion to use protocols and refine.
- It is important to start with the one early adopter nursing area who can help lead and then recruit early adopter champions from other units.

This is not just a change in practice but may also be a change in culture:

- This may very well require a change in culture, particularly physician culture. The physicians will be asked to trade their traditional way of considering interventions solely on their preference for a more standardized and effective approach. This may appear to be both a loss of control as well as irresponsible to give up that control.
- Nurses and physical therapists will also experience change in that this may be the first time they would have to collaborate to such a degree. Some may be uncomfortable with the notion of staff- driven protocol intra-dependent with physicians. Education and involvement of staff in the development of the protocols may help to mitigate.
- Protocols can be scary to physicians who are not used to them. This will be a change in how they work. Physicians learn from peers. Most physicians will follow their respected peers before they will follow "expert advice."
- This is an example of an innovation that will require small tests of change and planned spread driven by success. The ideal end result is the development of team-based care where each member of the team (physician, nurse, respiratory therapist) contributes to better and safer patient care.

Tips on How to Use the Model for Improvement

- Choice of test and intervention for HAPU reduction:
 - As highlighted above, there are many potential interventions for HAPU reduction. Where do you start? The team should ask themselves: "What is the greatest need at our facility?" Start with what will get you your biggest bang.
 - Is it skin risk assessment implementation needed?
 - Is it handoff communication between nurse on patient information such as risk and risk mitigation interventions needed/implemented?
 - Is a process redesign needed to improve skin risk assessment findings, causing appropriate interventions, e.g. specialty mattress?
 - Is it a need to focus on low costs interventions first such as implementing every two-hour turning?
 - Do not wait for the new beds to arrive or the new sheets to arrive to implement prevention strategies. Do small tests of change with what you have now and then work with the new technology later. New technology is not required for simple strategies such as turning patients or optimizing nutrition or improving handoff communications.
- Implementing a skin risk assessment tool



- Step 1: Plan Which skin risk assessment tool to use?
 - Choose an established evidenced-based practice tool such as the Braden Skin Risk Assessment Tool. Mentioned above are such tools. Choose one or two tools to test and have staff choose which one works best.
- Step 2: Do Keep scale of test small. Start first with one nurse, one shift. Only need to test with a few more nurses (two or three of varying experience level competent to expert) and a few patients as compared to a sample of 200.
- Step 3: Study Evaluate use and effectiveness. Which tool is easy to use and gives assessment findings that can be incorporated into the care plan?
- Step 4: Act Skin risk assessment documentation flow sheets may need to go through several "tweaks" before ready to use on a wide scale.
 - Know when to stop a test. If the test results show the change is not leading to improvement, then stop the test.
- Implementing Nursing Protocol to turn every two hours
 - Step 1: Plan Decide which unit and shift to do the small tests of change. They should be nurses who are willing to do the trials. Is there a unit known for being early adopters? Have you identified nurse champions who are willing to try changes first?
 - Step 2: Do Testing nursing protocol to turn patients at least every two hours.
 - Start simple one unit, one shift, one process.
 - Step 3: Study Staff huddle at the end of shift to evaluate the results of the process.
 - Ask themselves questions such as, "What worked well?" "What did not work well?" and "What do we need to change for the next test?"
 - Huddles are short and fast everyone stands, preferably with a beverage in hand.
 - Step 4: Act Do not wait for the next committee meeting to implement learning. Test the day on the same unit, with the same staff. Repeat until process seems to be working and then spread to another shift.





Appendix I: Educational Poster³¹



Appendix II: Clipboard reminder for patients at risk of pressure ulcers³²

SKIN RISK ALERT

SKIN BUNDLE INTERVENTIONS IN EFFECT!

SURFACE:

Be sure patient is on correct type of mattress. Do not use multiple layers of linens under patient. Keep linens free of wrinkles. Be sure patient is not lying on tubing, telephones or call bells.

KEEP TURNING:

Reposition patient at least every two hours when in bed. "Self" is not acceptable for documenting repositioning. Document the actual position the patient is observed in. Shift patient's weight at least every hour if up in chair. Use a chair pad when patient up in a chair.

INCONTINENCE:

Offer toileting assistance every two hours. If incontinent, give perineal care every two hours and as needed for stool incontinence. Apply a moisture barrier after incontinence care. If not incontinent, apply moisture barrier every 8 hours. Avoid diapers unless needed for containing excessive amounts of stool, patient is ambulatory and incontinent or saturates linens with most urinary incontinence episodes or patient requests diaper.

NUTRITION:

If patient has a nutritional deficit or is high risk for a nutritional deficit, order a nutrition consult. Look at what the patient has been taking in for nutrition and also look at albumin levels. Consider recent weight loss as well. Consider hydration status. Carry out nutrition orders and record supplement and meal intake

Assess skin every eight hours. Document breakdown description on Skin Flow Sheet daily

Document all of your interventions

Not a permanent part of the medical record



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Implementation Guide to Reduce Avoidable Readmissions

HRET Contact <u>hen@aha.org</u> (312) 834-7056 <u>www.hret-hen.org</u>



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Preventing Avoidable Readmissions Overview

Background:

- A 2009 study in the *New England Journal of Medicine* demonstrated that almost one-fifth (19.6%) of Medicare patients were readmitted to the hospital within 30 days of discharge and 34% were readmitted within 90 days.
- This research estimated that only 10% of these readmissions were planned and that the annual cost to Medicare alone of unplanned hospital readmissions exceeds \$17 billion.
- Performance with readmissions varies. Medicare 30-day rehospitalization rate varies 13-24% across states and varies even more significantly within states.

Suggested Aim:

Reduce hospital readmissions by 20% compared to the 2010 baseline by decreasing preventable complications during a transition from one care setting to another by 12/31/13.

Potential Measures:

Outcome:	30-day all-cause readmission rate (or count) for selected patient populations
	30-day all-cause hospital readmission rate (or count)
Process:	Percent of nurses using effective teach back methodology (observation)
	Percent of patients who had follow-up visit scheduled before being discharged

Primary Drivers	Secondary Drivers
Identify patients at	✓ Use a risk of readmission assessment tool and validate it using your own data
high-risk for	 Develop a method to stratify patients at higher risk of readmission
readmission	✓ Adopt an enhanced admission assessment
	✓ Assess the patient's engagement and assertiveness in managing their own care
Self-management	✓ Assign clear accountability for medication reconciliation
skills	✓ Educate patient regarding medication, need for medication, method of obtaining and taking
	medication once discharged
	 Educate patient on their condition, symptoms and what to do if symptoms worsen
	✓ Provide clearly written medication instructions using health literacy concepts
Coordination of care	✓ Obtain accurate information about primary care physician at the time of admission and create a
across the	patient centered record
continuum	✓ Ensure effective communication to non-hospital based care team members
	✓ Medication reconciliation at each transition of care
	✓ Send discharge summary to primary care physician with 48 hours of discharge
Adequate follow-up	✓ Prior to leaving the hospital, determine what after-hospital resources and appointments are needed
and community	and ensure appropriate planning
resources	✓ Work with patient and care provider to identify and address any barriers to making and attending
	follow-up appointment(s) and other follow-up needs such as medications, special diet, etc.

Making Changes:

This intervention is in the Collaborative with Reducing Adverse Drug Events (Reduce RED Collaborative). National meetings, webinars, monthly coaching calls, change packages and other tools will augment state hospital association activities

Key Resources:

- Re-engineered Discharge (RED): http://www.bu.edu/fammed/projectred/index.html
- Better Outcomes for Older Adults through Safe Transitions (BOOST):<u>http://www.hospitalmedicine.org/ResourceRoomRedesign/RR_CareTransitions/CT_Home.cfm</u>
- STAAR How to Guide: Improving transitions from the hospital to post-acute care
- AHRQ Tools on Medication Reconciliation: <u>http://www.ahrq.gov/qual/match/</u>
- The Care Transitions Program (Eric Coleman): <u>http://www.caretransitions.org/</u>
- The Care Transitions Model (Mary Naylor): <u>http://www.caretransitions.org/</u>



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Preventing Avoidable Readmissions Driver Diagram 2012-2013

Aim: Reduce Hospital Readmissions by 20% Compared to the 2010 Baseline by Decreasing Preventable Complications During a Transition from One Care Setting to Another by 12/31/13.

Primary Driver	Secondary Driver	Change Ideas
Identify patients at high-risk for readmission	 Effective risk assessment Simplified risk stratification Enhanced admission assessment for discharge needs Conduct patient activation assessment 	 ✓ Use a risk of readmission assessment tool and validate it using your own data. ✓ Adopt an enhanced admission assessment. ✓ Make readmission risk assessments easy for all to see and address. ✓ Find out who the primary caregiver is (if it is not the patient). ✓ Communicate who the primary caregiver is to members of the healthcare team, use white board, chart special entry, etc. so that there is a standard place for this information. ✓ Incorporate the Patient Activation Measure into the assessment function.
Self-management skills	 Enhance patient/caregiver knowledge of medications Enhance patient/caregiver knowledge of symptoms and self-care strategies Identify and address health literacy level and culturally appropriate training materials Use teach back to validate understanding Consider motivational interviewing and activation based coaching approaches 	 Perform accurate medication reconciliation at a minimum on admission and at discharge so that the medication list is as accurate as possible. Educate patients regarding each medication, need for medication, and method of obtaining and taking medication once discharged. Provide clearly written medication instructions using health literacy concepts. Develop patient-centered diagnosis and symptom educational tools that use health literacy concepts. Train clinical staff on teach back using role play and observe their technique once trained. Use "I" statements when speaking with patient and caregiver. "To make sure I did a good job explaining your medications, can you tell me?" Validate patient and caregiver understanding of discharge instructions.
Coordination of information across the continuum	 Create a patient centered record Adequately communicate to members of the care team who are not hospital based 	 Evaluate best practices and resources and already developed tools such as the Project RED After Hospital Care Plan (AHCP) and Coleman Personal Health Record. Determine which model will work in your organization.







Implementation Guide to Reduce Avoidable Readmissions 6

Primary Driver	Secondary Driver	Change Ideas
	 Use of a concise, standardized discharge transfer form 	 ✓ Evaluate IT support for completing the plan of care. ✓ Determine where key information is stored and how it will be compiled to complete the plan of care. ✓ Obtain accurate information about primary care physician at the time of admission. ✓ Send completed discharge summary to primary care physician with 48 hours of discharge.
Adequate follow-up and community resources	 Ensure timely follow-up with Primary Care Physician and other providers Consider post discharge calls/visits for high- risk patients Coordinate with available community services Consider programs for special populations: behavioral health patients, homeless patients, ESRD, HIV or other complex, high-risk populations. For integrated organizations, develop medical home capabilities. Coordinate where possible with other stakeholders and organizations to address special needs for patients 	 Prior to leaving the hospital, determine what after-hospital resources and appointments are needed and ensure they are incorporated in the after-care plan. Work with patient and care providers to determine any barriers to making and attending follow-up appointment(s). Work with patient and caregiver to determine any barriers to other follow-up needs such as medications, special diet, etc. In addition to these hospital driven elements, further benefits have been derived from post-discharge interventions including: post-discharge phone calls, home visits, home health referrals, etc. Those patients who are at highest risk of readmission may also benefit from more intensive community resources and support. For patients without a PCP, work with health plans, Medicaid agencies and other safety net programs to identify PCP. Consider hospital follow-up clinics run by hospitals, NPs if timely access to a PCP not available.

¹<u>http://www.insigniahealth.com/solutions/patient-activation-measure</u> ²<u>http://www.bu.edu/fammed/projectred/newtoolkit/3.%20How%20to%20deliver%20the%20RED%204.15.11.pdf</u> see 32-42 ³http://www.caretransitions.org/documents/phr.pdf



Preventing Avoidable Readmissions:

A now famous 2009 study published in the *New England Journal of Medicine* demonstrated that almost one-fifth (19.6%) of Medicare patients were readmitted to the hospital within 30 days of discharge and 34% were readmitted within 90 days. This research estimated that only 10% of these readmissions were planned and that the annual cost to Medicare alone of unplanned hospital readmissions exceeds \$17 billion. Performance with readmissions varies. Medicare 30-day rehospitalization rate varies 13-24% across states and varies even more significantly within states. Hospitals are making progress reducing avoidable readmissions by employing several effective strategies. While readmissions are the result of a variety of factors, the lack of care coordination and effective transitions of care are important contributors. Addressing complex issues across care settings is difficult and requires new tools, communication channels and care processes.

Several care models and care systems have been created to address the needs of patients in a complex system. Many of these approaches also have research support and/or significant experience with multiple hospitals to warrant consideration. This change package does not endorse any particular model or care system. Rather, common approaches and practices are highlighted. Hospitals should review the models listed in the key resources section and determine which approach is more effective for their structure, patient population, and most importantly, the leading causes of readmissions for their patients.

In sum, avoidable readmissions are common, costly variable across and within states and can be reduced with effective care coordination and transitions of care.

Suggested Aims:

Before the implementation work starts, the team must have a goal at which to aim. An aim statement for rehospitalization reduction efforts could include one of the following:

- Reduce hospital readmissions by 20% compared to the 2010 baseline by decreasing preventable complications during a transition from one care setting to another by 12/31/13.
- By the end of 2013, preventable complications during a transition from one care setting to another will be decreased so that (a selected group by hospital location, for example, specific unit or units or diagnosis, for example CHF, AMI, pneumonia, etc.) readmissions would be reduced by 20% compared to 2010.

Identify High-Risk Patients:

Understanding the patients who are more likely to be rehospitalized will enable you to target your limited resources. While there are many risk assessment tools available, for the most part, all share some key factors: prior admissions within certain time period, certain diagnoses, age and disposition. By using a risk assessment, you will be able to segment your patient population. Patients who are at a higher risk for readmission receive specific interventions based on your plan. Additionally, an assessment of patient activation will allow you to more closely target your interventions to be most readily understood and accepted by your patient.

Secondary Driver: Risk Assessment

Use a validated readmission risk assessment tool or use your own data to determine odds ratios for various factors within your patient data set. Risk for readmission is usually more than clinical risk factors such as number and type of comorbid factors or severity of illness. Many non-clinical factors play a role such as availability of the primary care physician, ability to get to ambulatory appointments (transportation), ability to fill all medications (insurance and financial constraints) and support structure for monitoring and assisting. Not every high-risk patient who is found with risk assessment tools and prepared throughout the hospital stay for clues about hidden factors that might contribute to an increased risk for readmission is a necessary redundancy. At a minimum, determine which patients were previously admitted and those who fail teach back.



Change Ideas:

- ✓ Select a risk assessment that is easy to implement, will require minimal training and can fit into current workflows. See sample risk assessment tools links in Appendix I.
- ✓ Periodically, validate the findings from the tool with your readmissions data to answer the question: "Is this risk assessment tool identifying our readmitted patients?" If you find patterns with other factors, include them in your risk assessment tool.
- Use a qualitative interview approach to understand non-clinical factors and where the ambulatory care system did not meet the individual needs of patients. For example, ask five patients to walk through the steps they used or did not use to address symptoms or issues prior to being readmitted.

Suggested Process Measure:

• Sample a small number of patients each month to determine if the risk of readmission assessment is performed reliably. Suggested sample size = 10 cases

Secondary Driver: Risk Stratification

Use the findings from your risk assessment to stratify your patients into segments or groupings and determine which interventions will be associated with the different segments. An example might be:

- Low risk of rehospitalization normal process
- Moderate risk of rehospitalization enhanced hospital process
- Highest risk of rehospitalization enhanced hospital process plus community intervention

Change Ideas:

✓ Determine a method to identify patients' intervention group. Locate this information in a place where it is accessible to the care team.

Suggested Process Measure:

• Sample a small number of patients each month to determine if the risk stratification is accessible to the care team reliably. Suggested sample size = 10 cases

Secondary Driver: Enhanced Admission Assessment

For patients who at a higher risk of rehospitalization, perform an enhanced admission assessment to determine who their primary provider/caregiver is and what their discharge needs are. Take into special consideration prior discharge plan failures if the patient had a prior admission. Identify potential barriers that might prevent the patient from being able to manage their care once they are discharged.

Change Idea:

- ✓ Communicate who the primary caregiver is to members of the healthcare team.
 - Use a standardized method for communication, i.e. white board, special chart entry, etc.

Suggested Process Measure:

Sample a small number of patients each month to determine if information about the primary caregiver is reliably accessible to the health care team. Suggested sample size = 10 cases

Secondary Driver: Patient activation

Not all patients, regardless of their level or readmission risk, will have the same ability to learn self-management techniques. Evaluating the patient's level of activation – that is, how engaged and self-assertive they are in managing their own care – will allow you to further tailor your interventions. Raising patient activation is associated with improved health outcomes.



Change Ideas:

- The Patient Activation Measure (PAM) is a proprietary measure and coaching program. Not all facilities will chose to use this measure.
 - For more information: <u>http://www.insigniahealth.com/solutions/patient-activation-measure</u>
- ✓ Consider tailoring education and coaching approaches based on PAM scores
- ✓ Determine if PAM scores change over time with different interventions

Suggested Process Measures:

• Distribution of Patient Activation level scores across categories (PAM scores fall into three categories).

Suggested Outcome Measure:

• The difference between PAM scores before and after intervention for high-risk patients.

"Hardwiring" the Identification of High-Risk Patients:

Determining the best risk-assessment methodology is much like looking for the "holy grail" – you never quite get it perfect. A main reason is that so many hard to quantify non-clinical factors are involved. More reliable approaches clearly define the processes for readmission risk assessment, risk stratification, enhanced admission assessment and patient activation. In addition, they also ask the questions: who is responsible, which risk assessment tool is used, where the results are recorded and communicated and which actions are taken as a result of different scores. If the risk assessment process is identifying fewer high-risk patients over time, the process is likely not hardwired. Test processes to ensure that they are compatible with patient and organizational needs. Revise processes as necessary and as a result of testing. In the end, hardwiring is the result of continual learning and improvement of systems.

Self-Management Skills:

All interventions should have patient self-management as their goal. Patients need to leave the hospital with the knowledge of how to manage their medical conditions. Keys to success are: knowledge of medications and early warning signals; knowing what to do if these signals occur and knowing what to do if they have any questions. In some cases, the patient is neither the primary caregiver nor the primary learner. Identify who provides the care for the patient, including multiple caregivers, and target self-management skill development to them.

Secondary Driver: Medications

Upon discharge, each person needs to know which medications they should take, the purpose for the medications and their clinical condition, and an easy-to-use system for obtaining and taking their medications. Medication management issues are a significant driver of avoidable readmissions.

Change Ideas:

- ✓ Medication reconciliation:
 - Perform accurate medication reconciliation at a minimum on admission and at discharge so that the medication list is as accurate as possible.
 - Give a list of medications to the patient that clearly identifies which medications should be taken use health literacy concepts.
 - For high-risk patients, work with home health or other ambulatory providers to ensure medication reconciliation is performed at home. In some settings, pharmacy technicians can reconcile medications by phone with low or moderate-risk patients.
- ✓ Medication education:
 - Educate patient regarding: each medication, need for medication, and method of obtaining and taking medication once discharged. Simplify instructions to the extent possible.



• Provide clearly written medication instructions using health literacy concepts. Pictures of medications that accompany easy to understand text can help some patients.

Suggested Process Measures:

• Sample a small number of patients each month to determine the patient's level of understanding regarding their medications. Suggested sample size = 10 cases

Secondary Driver: Knowledge of Symptoms and Red Flags

Patients should understand when their condition begins to worsen from whom and how they should obtain assistance. When patients have this level of understanding, they can obtain assistance early and thereby prevent urgent and emergency medical needs. Some patients understand when red flags occur but lack the assertiveness or problem solving skills necessary to navigate the ambulatory process, especially if their doctor is not available.

Change Ideas:

- ✓ Develop patient-centered diagnosis and symptom educational tools that use health literacy concepts.
- ✓ Consider tools that are easily accessible such as wallet cards, refrigerator magnets, etc.
- ✓ Keep red flag messages simple to understand.
- ✓ Determine the patient and caregiver's familiarity with managing red flags and steps to find help to resolve the problems. Script system navigation steps when appropriate.

Suggested Process Measure:

• Sample a small number of patients each month to determine patient's level of understanding regarding their "red flags." Suggested sample size = 10 cases

Secondary Driver: Health literacy level and culturally appropriate training materials

In order to be effective, training materials must be understandable and useful, geared to address your patient population and their specific needs. Thus, materials should be customized and patient/family coaching provided using literacy and cultural competency principles. Visual or graphic displays can aid narrative text, even with high literacy patients.

Change Ideas:

- ✓ Develop patient-centered training materials.
- ✓ Make materials readily available.
- ✓ Have a patient focus group or patient counsel assist you in developing patient education materials.

Suggested Process Measure:

• This is a task. Determining the effectiveness of educational materials requires qualitative and perhaps quantitative assessments for comprehension. Materials should be refined until maximal effectiveness is achieved. Once achieved, it does not need to be continuously measured.

Secondary Driver: Use Teach Back to Validate Understanding

Use "teach back" as a communication tool to validate the patient's understanding of instructions. Teach back is a method where clinicians ask patients, in a non-threatening manner, to recite the instructions just given. It requires shifting the responsibility for effective communication to the clinician who provides the information. It also requires prioritizing teaching points since everyone has a limit on the quantity of information understood and processed. If a patient or caregiver cannot effectively "teach back," that is a red flag that additional support is necessary. Failure of teach back may have two components: 1) the clinician's skills at using teach back, and 2) the patient or caregiver's understanding. Regular failure, determined by observational methods, requires an analysis of both components.



Change Ideas:

- Train clinical staff on teach back using role play and observe their technique once trained. Consider creating videos with your staff giving examples of good and not so good teach back.
 - Use "I" statements when speaking with patient and caregiver. "To make sure I did a good job explaining your medications, can you tell me ...?"
 - Script specific teach back questions for staff to use such as: "*Can you tell me who you would call if you gained five pounds?*"
- ✓ Determine where and how the status of patient understanding is documented in the medical record. For example, is there an education record? Does it need to be modified to address these issues?
- ✓ Determine how this information is passed from caregiver to caregiver throughout the patient's stay. For example, how is patient understanding transferred from shift to shift?
- Monitor the use and effectiveness of teach back through observation and validation of patient understanding. For example, have a nurse manager interview a patient to determine their level of understanding and compare that to what is documented. Provide real time feedback if observation and documentation are not in concordance.
- Consider using motivational interviewing techniques for patients who are at high-risk and who have lower activation. Motivational interviewing is a technique to increase the participation and desire of the patient to carry out self-management tasks. For more information about motivational interviewing, go to http://www.motivationalinterview.org/

Suggested Process Measure:

- ✓ Rate of effective teach back (use medication and "red flag" education) observational, semi-qualitative.
- ✓ Number of times teach back fails in a month, by unit.

"Hardwiring" Self-Management Skills:

Producing high-quality self-management skills requires ongoing assessment and refinement. Since a variety of techniques are used, each will need to be refined and adapted to specific populations and individual patients. It is also unlikely that all patients will have adequate self-management skills acquired during their hospital stay and ongoing skill development at home and with the ambulatory system is needed to hardwire completely.

One way to create a system of learning is to create a patient/family council or other formal structure that is tasked with responsibilities such as reviewing patient education materials. Also, consider teach back as a key competency for all clinical staff. Include training on teach back in new employee orientation. Formally evaluate competency with teach back as a component of performance evaluation.

Coordination of Information Across the Continuum:

Coordinate patient information so that it is accessible where and when it is needed to care for the patient. Care coordination is largely information management with appropriate and timely intervention.

Secondary Driver: Create a Patient-Centered Record

Make the patient a key source of his/her clinical information. Develop a patient-centered record that is used by the patient to manage their care and used by the patient to communicate with their clinical providers.

Change Ideas:

- ✓ Evaluate patient-centered record best practices and resources and already developed tools such as the Project RED's After Hospital Care Plan (AHCP) and the Coleman Personal Health Record (PHR).
- ✓ Determine which model will work in your organization.



- ✓ Evaluate IT support for completing the plan of care.
- ✓ Determine where key information is stored and how it will be compiled to complete the plan of care.

Suggested Process Measure:

✓ Percent of patients with a complete, customized after-care plan.

Secondary Driver: Communication to Other Health Providers

Communicate key information to other care providers who are not based in the hospital. Do this on a timely basis. Also see the section below on post-hospitalization follow-up.

Change Ideas:

- ✓ Obtain accurate information about primary care physician (PCP) at the time of admission.
 - Sometimes the patient may not know who his/her primary care provider is so using other questions such as: "Which doctor prescribed your medication?" or "Where do you go when you need to see a doctor?" as other ways that may help you obtain accurate information.
 - At admission if this information is not obtainable due to patient condition, have a process in place to obtain the information post admit.
- ✓ Ask non-hospital providers what information they need and what is the best method for them to obtain it.
- ✓ Send discharge summaries to primary care providers within 48 hours of discharge.
- ✓ Use a concise, standardized discharge or transfer form. Some states have created standardized transfer forms for all hospitals and skilled nursing facilities. This process streamlines communication and has led to more effective use of transfer forms and improved communication.

Suggested Process Measure:

✓ Percent of PCPs (or other physician follow-up) who received the after-care plan within 48 hours.

"Hardwiring" Coordination of Information Across the Continuum of Care:

Develop a patient/family council or other formal structure that is tasked with responsibilities such as reviewing the patient centered discharge plan of care. Seek information from practitioners regarding how and what information they wish to receive. In general, the receiver wants more information in an easy to read format. This needs to be balanced across the resources required to produce "enough" information across different settings. IT may help balance the "needs" of the receivers and the resource limits of the "senders" but invariably, tradeoffs are required to develop efficient and sustainable systems of information coordination.

Develop regular communication sessions with post-acute providers (long-term care, ambulatory care, home health) to help identify and fix care coordination and transition problems and improve the reliability and sustainability of new systems, tools and practices.

Adequate Post Hospitalization Follow-up and Community Resources:

Develop a plan of care for the patient to follow once discharged that is designed to meet the required level of care. After-care plans are crucial for care coordination and require the insights of the entire clinical team.

Secondary Driver: Physician/Other Care Provider and Resource Follow-Up Needs

Determine when and who the patient needs to be seen by once they leave the hospital. Determine other afterhospital needs such as: medications, durable medical equipment, oxygen, etc.



Change Ideas:

- ✓ Upon admission, begin to determine and plan for what after-hospital resources and appointments are needed.
- ✓ Facilities and their physicians should determine the acceptable length of time between discharge and the first follow-up visit with a clinician. Ideally that appointment should occur within 7-14 days. Track your readmission data to determine when patients are returning. That analysis will inform you about the time frame needed for follow-up appointments for your patients.
 - Work with patient and care provider to determine any barriers to making and attending follow-up appointment(s).
 - If barriers are identified, determine how they can be resolved. For example, coach the patient to call his/her physician and say: "I need to make an appointment to see the doctor because I just got out of the hospital and I need to be sure that I am taking my medications correctly."
- ✓ Consider hospital run follow-up clinics run by hospitalists, or Nurse Practitioners if timely access to a PCP not available.
- ✓ For patients without a PCP, work with health plans, Medicaid agencies and other safety net programs to identify PCP.
- ✓ Work with patient and caregiver to determine any barriers to other follow-up needs such as medications, special diet, etc.
 - If barriers are identified, determine how they can be resolved. For example, can a longer supply of medications be obtained prior to discharge? Can medications be mailed rather than picked up?

Suggested Process Measure:

✓ Percent of patients who had follow-up visit scheduled before being discharged (initially, use sampling techniques, start with a specific population).

Secondary Driver: Post Discharge Calls and Visits

Develop a process to call and/or visit those high-risk patients to ensure that they are able to carry out their plan of care. Determine if the plan is understood and whether it requires any changes.

Change Ideas:

- ✓ Determine which patients will be called, who will do the calls and when the calls will occur.
 - Gather information from these calls to find trends that can inform your readmission team. For example, repeated questions about medications may guide your team to develop different education materials or processes.
- ✓ Anticipate high no answer rates for calls. Patients and caregivers tend to answer calls from a clinician they met in the hospital. Determine if patterns occur with unanswered calls, e.g., time of day, location of patient, level of activation.
- ✓ Maximize the continuity of post-discharge calls when possible.
- ✓ Consider medication reconciliation for low or moderate-risk patients by phone. Pharmacy technicians can also support home medication reconciliation.
- ✓ Determine which patients require a home visit, who will do the visits and when they will occur.
 - o Review home health referrals.
 - o Review home health readmission patterns to determine opportunities for focused interventions.

Suggested Process Measure:

- ✓ Percent of calls answered by patients and/or caregivers.
- ✓ Number of times care plan is altered during the month.



Secondary Driver: Coordinate with the Community-Skilled Nursing

Evaluate the percentage of rehospitalized patients coming from skilled nursing facilities. Collaborate with your SNF partners on readmission reduction strategies.

Change Ideas:

- \checkmark Review admission source data to determine which SNFs drive your readmission rate.
- ✓ Meet with SNFs and start a dialogue about strategies to avoid preventable readmissions.
 - Consider INTERACT II <u>http://www.interact2.net/</u>
 - Periodically review readmissions with the SNF to look for improvement opportunities
- ✓ Consider providing after-hours physician phone triage/consultation services for SNFs who are considering sending a patient to the Emergency Department.
- ✓ Standardize transfer information form hospital to SNF. Several states have done this at the state level and work to balance the needs of the "receivers" and the resource limits of the "senders."
- Patients at the highest risk of rehospitalization may benefit from the support of other clinical and nonclinical community resources.
 - Map out the resources in your community.
 - Consider partnering or developing a referral relationship with community based resources such as local area agencies on aging, home health, etc.
 - For patients without a PCP, work with health plans, Medicaid agencies and other safety net programs to identify PCP.

Secondary Driver: Determine the Community Resources for the Special Needs of Highly Vulnerable Populations

Certain more vulnerable patient populations may benefit from additional resources such as: behavioral health patients, homeless patients, ESRD, HIV or other complex, high-risk populations.

Change Ideas:

- ✓ Consider telehealth or other remote monitoring.
- ✓ Connect with already developed community resources (e.g., nutrition programs, transportation programs, case management programs) or identify the need for new services.

Suggested Process Measure:

- ✓ Percent of patients with community support services identified and activated.
- ✓ Mean number of community support services activated per high-risk patient.

Secondary Driver: For Integrated Organizations, Develop a Medical Home

Proactively identify high-risk patients. Inclusion in a comprehensive medical home program may prevent avoidable admissions. This involves regular outreach for high-risk patients to monitor their health and wellness and is built around designed information services and a multidisciplinary ambulatory infrastructure. For more information about medical homes, go to http://www.ncqa.org/LinkClick.aspx?fileticket=ycS4coFOGnw%3d&tabid=631

Change Ideas:

- ✓ Consider ongoing case management based in the medical home.
- ✓ Consider complex care clinics or other approaches.
- ✓ Consider population registries.
- ✓ Consider accreditation of medical homes.



Suggested Process Measure:

✓ See linkages

"Hardwiring" Post Hospitalization Follow-Up and Linkages with Community Resource:

Clearly define the processes for addressing follow-up needs including: post discharge calls, visits and referral to community resources. Determine if the correct patients are being supported based on an analysis of data. Test processes to ensure that they are compatible with patient, organizational, and community needs. Revise process as necessary as a result of testing. Determine accountability, tools and documentation requirements. Train involved staff in these new processes. Monitor results and provide feedback to involved staff members.

Establish a forum for community providers to link with the hospital to exchange needs and resources. On a periodic basis, share data about readmissions with outside agencies so that all involved parties can review the case and determine opportunities for improvement. Develop a community forum to prioritize and address the issues that emerge from various settings such as palliative care and end of life planning.

Potential Barriers:

Reducing readmissions is the right thing to do but it is not necessarily aligned with reimbursement at the current time. Understanding the financial ramifications from readmissions helps identify where early gains may be beneficial to all.

Reducing preventable readmissions is challenging work because it requires the involvement of many individuals and systems both within and outside of the hospital. Time and resources must be given to understand the organization's current level of performance and its gaps as well as selecting appropriate interventions that match the needs identified in the gap analysis. Once interventions are selected, they need to be tested, adapted and implemented. Common barriers include: drift to other priorities, lack of accountability to complete the initiative and inadequate resources.

Using administrative leadership sponsorship to help remove or mitigate barriers:

- Align readmission reduction efforts with strategic business priorities.
- Provide adequate resources to support the improvement work.
- At least monthly review process and outcome measures with team leader and identify barriers.
- Develop a strategy to overcome barriers and evaluate the effectiveness of the strategy.

This is not just a change in practice but may also be a change in culture:

Culture and practice changes can be very challenging. They mean giving up what is comfortable for what is unknown.

• Keep the aim front and center. Unite and motivate around the goal.

The need for interdisciplinary communication and collaboration is significant when striving to reduce readmissions. Just getting everyone in a room and talking together is a great first step. Since disciplines may be more familiar with working independently, collaboration across disciplines may present a change in culture.

- Create a structured forum where different disciplines can share their understanding and roles.
- Routinely share patient stories.

Another change in culture that may be associated with readmission reduction efforts is the movement from a more paternal approach, where we tell the patient what to do, to a patient-centered approach, wherein the patient plays a pivotal role in his/her care. Some clinicians are not used to validating the patient's understanding



or asking the patient why he or she feels that he or she needed to be readmitted.

- Use teach back.
- Involve patients to actively participate in care design.
- Seek information from patients about the reason for readmission.

Readmission reduction work often includes the need to partner with both clinical and non-clinical members of the community. Once again, just getting your community partners together is a great first step.

- Create a forum for community involvement. Uncovering local agencies and other organizations interested in effective care outside of the hospital is often a rewarding and supportive ally.
- Use community organizing principles to engage partners outside of the usual care community <u>http://isites.harvard.edu/icb/icb.do?keyword=k2139&pageid=icb.page12185</u>

Tips on How to Use the Model for Improvement:

How Will You Know If You Made an Improvement?

Throughout the course of your readmission reduction initiative, you will measure outcomes (readmission rates) and various processes that contribute to reduced rates. Potential Measurement(s):

Outcome: 30 day all-cause readmission rate 30 day all-cause readmission rate for selected patient populations 30 day all-cause readmission count 30 day all-cause readmission count for selected patient populations

Process:

Compliance with individual processes, e.g., percent of patients who receive a written discharge plan Aggregate compliance with ALL processes

Consider collecting both qualitative and quantitative data. Many teams overlook the importance of quantitative data especially when they are testing new processes. During testing, it is very important to collect data from your users on their satisfaction or lack thereof with the change being tested.

Understand Your Current Processes and Data

Before selecting the evidence-based approaches to implement in your organization, perform an intensive assessment of your current situation. Interview returning patients and their caregivers with a goal of finding out from them why they believe they were readmitted. Interview the primary care providers of these readmitted patients to determine if they were aware of the original hospitalization and their patient's discharge needs. Ask them what they believe occasioned the rehospitalization? Review the medical records for all past readmissions of these five patients within the past 90 days to discover the patient's condition and dispositions over time. Pull data for all of your readmitted patients for the past year and sort these data so that you can learn your rates, most common diagnoses, etc. Review key processes within your organization to understand the gap between your current processes and the processes that need to be implemented to reduce readmissions. Find out which processes are present and reliable, which are present but not always reliable, and processes which are not currently present.

What Are Your Patients Telling You?

Talk to the five patients and their caregivers who had previously been discharged from your organization and are now readmitted. Try to have the patient/caregiver articulate in their words why the readmission occurred. You may need to ask a series of open ended why questions to get at the specific failures. See sample tool in Appendix I.



You can ask questions used in the STAAR initiative or others such as:

- How do you think you became sick enough to come back to the hospital?
- Did you go to your doctor's office before you came back to the hospital? If yes, who is your doctor? If not, why not?
- Did you have any problems getting to see your doctor?
- Has anything gotten in the way of you taking your medicines?
- How do you take your medicines and set up your pills each day?
- Tell me about the kinds of meals you typically eat each day.
- Why do you think you were readmitted to the hospital?
- What do you think needs to happen for you to be able to stay healthy enough to stay at home?

What gaps did you identify?

What processes do you need to change to fill these gaps?

What is the Primary Care Physician (PCP) or Other Providers of Care Telling You?

Contact the PCP or other providers who cared for the patient after discharge. Ask them what they believe occasioned the patient's readmission? The goal here is not to collect a clinical diagnosis, rather it is to uncover the reason why the patient's clinical condition deteriorated. Determine if they were aware of the patient's hospitalization and if they received a discharge summary. See sample tool in Appendix I.

- What gaps did you identify?
- What processes do you need to change to fill these gaps?

What Are Your Medical Records Telling You?

Review the medical records of the patients you just interviewed. Start with the initial admission and review all subsequent readmissions. Review all admissions in the prior 90 days. See sample tool in Appendix I.

Find out items such as:

- Admission and discharge dates, days in between admissions.
- Reason for each admission/readmission.
- Condition at discharge from each stay.
- Where patient was discharged to after each stay.
- Medications at discharge after each stay.
- At the time of each discharge, did the patient/caregiver have: a clear medication list, a follow-up visit scheduled and confirmation that the patient/caregiver had the means to obtain the medications and attend the visit?
- Was there documented evidence of patient/caregiver's understanding of discharge instructions, e.g., "teach back"?
- Documented social needs that may have contributed to readmission.

What did you learn from this chart review?

What was missing in these medical records that you wished you knew?

What processes do you need to change to fill these gaps?



What Is Your Data Telling You?

Pull the data for all readmissions for the prior year. You will want to run reports to answer the following types of questions:

- What is your readmission rate by month for the past twelve months?
- What types of patients are being readmitted?
- What are your highest risk groups?
- Consider factors such as: age, where patients are being readmitted from, where they were discharged to prior to the readmission, their primary and secondary diagnoses.

What have you learned from this review of your data?

Based on your findings, do any priorities stand out to you?

What Are Your Processes Telling You?

Understand your current processes and the degree to which they are reliable. This is far more than a review of your policies and procedures. Actually trace through your processes to determine their level of reliability. Start by reviewing your policies and procedures, forms and other printed materials. Ask, "Do we need to make any changes?" Find out how the staff members are trained to perform the process. Ask, "Do we need to make any changes?" Then trace these procedures to determine if they are widely known and followed. Did you find evidence of these processes in your chart reviews, observations and interviews? Also, interview at least three staff members who routinely admit and discharge patients to ascertain their understanding of these key processes. Do you routinely monitor these processes? If so, what is measured, by whom, how often and where does the data go? See sample tool in Appendix I.

Understand your current admissions process

Do you reliably collect data on admission about the primary caregiver or key learner by asking such questions on admission as: "Who takes care of you at home? Who helps you with your medications? Who goes to the doctor's appointment with you?" Who collects this information? Where does it go? Is it displayed in such a way that it is easily accessible by other healthcare providers, i.e. on a white board in the patient's room or in a common place in your medical record?

Understand your current patient/family teaching processes

Across the dozens of completed studies and initiatives underway, organizations with the best results have the following traits in common:

- Teaching efforts are consistently targeted to the appropriate key learner.
- Educators consistently evaluate patients' understanding of the information provided.
- Organizational culture supports efforts to prioritize patient education.
- Strategies and technologies are adopted to make patient education activities fit easily, if not automatically, into hospital employees' workflow.
- Education materials are designed thoughtfully with the patient in mind.

Who receives teaching? When and how often is this performed? How is understanding demonstrated? Can your patients/families reliably teach back to you an adequate understanding of their conditions, medications, discharge follow-up needs, etc.? Do you use teach back? How do you evaluate staff competency to perform teach back? Do you include all of the following types of teach back questions throughout the patient's stay: knowledge of



medications; diet, etc.; attitude – why these are important; behavior questions – how will you remember, organize, etc.?

Are your written training materials appropriate for the languages and reading level of your patients?

Understand your coaching processes

- Does your coaching model work to transfer self-management skills to the patient/caregiver? How do you know it is effective?
- Understand your hand-over processes.
- Does your patient reliably leave your organization with a clear patient health/transitions record which includes a clear list of medications to take upon discharge? Is there a plan to obtain the medications if they are not provided by the organization?
- Does your organization reliably communicate key information to the next providers of care? Are discharge summaries completed and sent to the PCP within 24 hours of discharge? Is there a standardized method of communicating to other organizations such as SNFs? Does the method meet the patient's needs?

Understand your post-acute care follow-up process

- Does your patient have adequate and reliable follow-up? Is a follow-up appointment scheduled prior to discharge? Is there a process in place to check to see if the patient made it to the appointment and an intervention if he/she did not?
- Do you have a process in place for post discharge follow-up calls or telehealth monitoring?
- Do you know who the highest risk patients are?
- Do you have specific strategies in place for these patients?
- What did you learn from this review of processes?
- Has your thinking about readmissions changed as a result of this review? If so, how?
- What was missing in your current processes?
- Do not be surprised to find gaps in these processes. Most of your improvement work will be done here. You will also find bright spots, things that are working well. Find out why so you can replicate these conditions elsewhere.

Select a Process to Improve:

Depending on the findings of your diagnostic activities, you will select improvement priorities. Your priorities might be based on criteria such as: potential impact, level of readiness, availability of resources, etc. If, for example, you selected determining which readmission risk assessment should be used by your facility, you might do the following:

- Review a variety of risk assessment tools.
- Select a tool that appears to be compatible with the needs and abilities of your organization.
- Ask: "Is there anything we need to modify before we test this here?"
- If yes, make the modification (note that if you are using a validated tool, modifications may interfere with the fidelity of the tool).

Testing Change Ideas:

Plan: Tomorrow a nurse test this readmission risk assessment tool on his/her first admission **Do:** Nurse tests the readmission risk assessment

Study: At the end of the shift, the team huddles with the nurse to ask questions such as:

- "Were there any challenges in completing the assessment?"
- "Are there any suggestions for modifications of the tool or the process?"



Act: Make any recommended change and retest to determine if the changes are an improvement. If no changes are suggested, plan additional testing with more patients the following day.

Once the assessment has been tested successfully on several more patients, you can expand the test to other nurses.

Document each PDSA cycle so you will have a record of the changes you implemented. You can run several PSDA cycles in parallel. For example, while one group is working on the readmission risk assessment, another might be testing change for obtaining accurate information about the PCP. Coordinate the findings from all of your PDSA cycles so that you can keep track of the entire project.



Appendix I:Sample Tools

Link to Personal Health record - <u>http://www.caretransitions.org/documents/phr.pdf</u> Link to After Hospital Care Plan -<u>http://www.bu.edu/fammed/projectred/newtoolkit/3.%20How%20to%20deliver%20the%20RED%204.15.11.pdf</u> see pp. 32-42



Appendix II: Sample Validated Risk Assessment Tool

Attribute	Value	Points	Prior Admit	Present Admit
ength of Stay	Less 1 day	0		
	1 day	1	1	
	2 days	2	1	
	3 days	3		
	4-6 days	4		
	7-13 days	5		
	14 or more days	6		
Acute	Inpatient	3		
admission	Observation	0		
Comorbiditur	No prior history	0		
(Comorbidity points are cumulative to maximum of 6 points)	DM no complications. Cerebrovascular disease, Hx of ML PVD, PUD.	1		
	Mild liver disease, DM with end organ damage, CHF, COPD, Cancer, Leukemia, lymphoma, any tumor, cancer, moderate to severe renal dz	2		
	Dementia or connective tissue disease	3		
	Moderate or severe liver disease or HIV infection	4	1	
	Metastatic cancer	6		
Emergency	0 visits	0		-
Room visits	1 visits	1		
during previous	2 visits	2		
6 months	3 visits	3		
	4 or more visits	4		



Appendix III: Sample Risk Assessment Methodology

(Use organization's own data) **Risk Assessment Formula Evaluation** The factors considered are displayed below. Characteristic: Length of stay Admission in the past 3 months Month of admission Attending physician **Discharge destination** Age by decade Diagnosis Comorbidity (1st 12 ICD-9 codes) Days between discharge and readmission Insurance Fields to be added after the proof of concept Fall risk Caregiver Depression Dementia Polypharmacy (>5 medications on discharge) Receiving high risk medication (Beer's listing) Health literacy

Six months' worth of data was collected. The data was entered into a relational database (FileMaker Pro, FileMaker, Inc., version 11). Information was collected for all patients discharged. The fields listed above were used to create an odds ratio describing the characteristics power in predicting readmission (formula 1). The odds ratios with their corresponding characteristics were rank ordered. The top 10 characteristics were used to perform a linear regression analysis. This can be done in most statistical programs, including the functions in Excel, Microsoft Word. The factors showing the greatest power to predict readmission (R squared and t-score, p-value) were selected for the formula. The R-squared value was 0.7 with highly significant p-values. The four factors having the greatest power for our patient population are: age, prior admission within the previous 90 days, discharge to skilled nursing facility, home health care and residential care facility, and specified ICD-9 codes. The odds ratio was used to weight the individual elements of the predictive formula. The formula was calculated and converted to a percentage risk for readmission over the baseline risk for the entire population of patients discharged.

Formula 1: Determine the rate of readmission for a characteristic

Patients readmitted with specific characteristic divided by # patients with this specific characteristic.

100 patients with CHF were readmitted; there were 1000 patients discharged with the diagnosis of CHF. Readmission rate 10%.

<u>Formula 2: Determine the overall readmission rate for the entire population</u> # Patients readmitted divided by # patients admitted. 1000 patients were readmitted; there were 10000 patients discharged. Readmission rate 10%.

In this fictitious example, there is no additional risk predicted for patients with CHF.



Odds ratio = <u>Readmission rate patient with characteristic (rate with CHF 10%)</u> Readmission rate for entire population (hospital readmission rate 10%)

Odds ratio is 1.0.

Conclusion: patients with CHF are no more likely to be readmitted than any patient admitted to the hospital.

Increased Risk for Readmission

Patients readmitted who are discharged to a SNF divided by # patients discharged to a SNF.

Example: 300 patients d/c'd to a SNF were readmitted; there were 1000 patients discharged to a SNF. Readmission rate 30%.

Use the overall readmission rate for the entire population (10% in this example)

Patients readmitted divided by # patients admitted.

1000 patients were readmitted; there were 10000 patients discharged. Readmission rate 10%.

In this fictitious example, there is additional risk predicted for patients discharged to a SNF.

Odds ratio = <u>Readmission rate patient with characteristic (rate with CHF 30%)</u> Readmission rate for entire population (hospital readmission rate 10%)

Odds ratio is 3.0.

Conclusion: patients discharged to a SNF have 3 times the risk of being readmitted in comparison to all patients discharged from the hospital.

This seems obvious when you say it, but it was a surprising realization to many seasoned clinicians, especially those who do not discharge frequently to skilled nursing facilities.

A sample formula, which is currently in beta test, is: Age factor is 1.4 if patient >90

> 1.5 if patient 80 to 89 1.4 if patient 70 to 79 1.2 if patient is 60 to 70 0.9 if patient is <60

Prior admission factor – 2.8

Diagnosis factor – 1.9 if CHF

1.8 if pneumonia or COPD
 1.4 if chest pain
 1.5 if CVA

Disposition destination factor =

1.4 if SNF
 1.3 if Residential Care Facility
 1.3 if Home Health Care
 1.0 if Home



Weighting factor predicting readmission = Age factor + prior admission factor + diagnosis factor+ disposition destination factor

Baseline readmission rate = 11.4%

A readmission rate of 11.4% equals an odds ratio of .12

Odds ratio for readmission is odds ratio for readmission baseline * weighting factor predicting readmission

Example: The odds of a 90 year old patient with CHF, readmitted within 90 days and discharged to a SNF being readmitted are: (1.4 + 1.9 + 2.8 + 1.4) \times 0.12

(1.4 + 1.9 + 2.8 + 1.4) * 0.12 Age odd



Questions	Pt./Caregiver Name	Pt./Caregiver Name	Pt./Caregiver Name
Number of days since the last discharge?			
How do you think you became sick enough to come back to the hospital?			
Physician Questions - Did you go to your doctor's office before you came back to the hospital? If yes, who is your doctor? If not, why not? Did you have any problems getting to see your doctor?			
Medication Questions - Has anything gotten in the way of you taking your medicines? How do you take your medicines and set up your pills each day? Can you tell me which medications you are supposed to take each day?			
Dietary Questions - Tell me about the kinds of meals you typically eat each day.			
Why do you think you were readmitted to the hospital?			
What do you think needs to happen for you to be able to stay healthy enough to stay at home?			
What did you learn from the patient?			

Appendix IV: Sample Patient Interview Tool



Appendix V: Sample Provider Interview Tool

Questions	Pt. Name	Pt. Name	Pt. Name
Number of days since the last discharge?			
Were you aware of the patient's last discharge from the hospital?			
Did you receive timely follow-up information from the hospital about your patient's condition and any changes to his/her medications?			
Did you provide any follow-up visits with the patient since his/her discharge and this readmission?			
Why do you think the patient needed to be readmitted? (The goal here is not to collect a clinical diagnosis rather it is to uncover the reason why the patient's clinical condition deteriorated).			
What do you think needs to happen for your patient to be able to stay healthy enough to stay out of the hospital?			
What did you learn from the providers?			



Appendix VI: Sample Medical Record Review Tool

Questions	Pt. Name & MR #	Pt. Name & MR #	Pt. Name & MR #
In the past 90 days, how many acute care admissions has this pt. had? List the dates of all admissions.			
In the past 90 days how many ED visits has this pt. had? List the dates of all visits.			
What was the reason for each admission?			
What was the condition at each discharge?			
Where was the patient admitted from and discharged to for each admission?			
For each discharge, did the pt/caregiver have: a clear med list, a follow-up visit scheduled and confirmation that the pt./caregiver had the means to obtain the meds and attend the visit?			
Was there documented evidence of pt./caregiver's understanding of discharge instructions, e.g. "teach back"?			
Were any social needs documented?			
What did you learn from the medical record review?			


Appendix VII: Sample Process Review Tool

Process Questions	List and review any policies and procedures or forms related to this process? Are any changes needed?	Review training materials for involved individuals? Any changes needed?	Observation of actual practice through: chart review, staff interview, pt. interview or unit observation. Were desired practices evident on at least three separate	Describe any monitoring that is performed regarding the process. What measures are collected? How frequently? Who collects and aggregates these data? Where do the
			occasions?	findings go?
Enhanced Admission Assessment				
Enhanced Admission - Do you routinely				
ask the pt./caregiver upon admission:				
"Who takes care of you at home? Who				
helps you with your medications? Who				
goes to the doctor's appointment with				
you?"				
Is there a white board or some other				
method to communicate this				
information to other providers? Is it				
complete and up to date?				
Teaching and Coaching Processes				
Who receives teaching? When and how				
often is this performed? How is				
understanding demonstrated? Can				
your patients/families reliably teach				
back to you an adequate understanding				
of their conditions, medications,				



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discharge follow up needs, etc.?		
Do you use teach back?		
How do you evaluate staff competency		
to perform teach back?		
Do you include all of the following		
types of teach back questions		
throughout the patient's stay:		
knowledge of medications, diet, etc.,		
attitude – why these are important,		
behavior questions – how will you		
remember, organize, etc. ?		
Are written training materials		
appropriate for the languages and		
reading level of your patients?		
Does your coaching model work to		
transfer self-management skills to the		
patient/caregiver? How do you know it		
is effective?		
Hand Over Processes		
Does your patient reliably leave your		
organization with a clear patient		
health/transitions record which		
includes a clear list of medications to		
take upon discharge?		
Is there a plan to obtain the		
medications if they are not provided by		
the organization?		
Does your organization reliably		
communicate key information to the		
next providers of care? Are discharge		



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summaries completed and sent to the		
PCP within 24 hours of discharge?		
Is there a standardized method of		
communicating to other organizations		
such as SNFs? Does the method meet		
the patient's needs?		
Post-Acute-Care Follow Up Processes		
Does your patient have adequate and		
reliable follow-up? Is a follow-up		
appointment scheduled prior to		
discharge? Is there a process in place		
to check to see if the patient made it to		
the appointment and an intervention if		
he/she did not?		
Do you have a process in place for post		
discharge follow-up calls or telehealth		
monitoring?		
Do you have specific strategies in place		
for high-risk patients? How do you		
determine which patients are high-risk?		



Key Resources

- Robert Wood Johnson Foundation, "Combining Better Systems and Intensive Patient Education for Better Heart Care," March 24, 2010, <u>http://www.rwjf.org/quality/product.jsp?id=58789</u>
- State Action on Avoidable Rehospitalizations (STAAR) Initiative, <u>http://www.ihi.org/IHI/Programs/StrategicInitiatives/STateActiononAvoidableRehospitalizationsSTAAR.ht</u> <u>m</u>
- Care Transitions Program <u>http://www.caretransitions.org</u> Eric A. Coleman, MD, MPH
- Project RED (Re-Engineered DC) <u>http://www.bu.edu/fammed/projectred/</u> Brian Jack, MD
- Project BOOST (Better Outcomes for Older adults through Safe Transitions) <u>http://www.hospitalmedicine.org/ResourceRoomRedesign/RR_CareTransitions/CT_Home.cfm</u> Mark Williams, MD, FHM
- Transitional Care Model <u>http://www.transitionalcare.info</u> Mary D. Naylor, PhD, RN, FAAN
- Patient Activation Measure <u>http://www.insigniahealth.com/solutions/patient-activation-measure</u>
- INTERACT II <u>http://www.interact2.net/</u>
- Hospital 2 Home sponsored by the American College of Cardiology and the Institute for Healthcare Improvement http://www.h2hquality.org/





Implementation Guide to Surgical Site Infection and Safe Surgery

HRET Contact <u>hen@aha.org</u> (312) 834-7056 <u>www.hret-hen.org</u>



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Reducing the Risk of Surgical Site Infections

Surgical site infections (SSIs) are associated with significant patient morbidity and mortality. It is estimated that between 750,000 and 1 million SSIs occur in the United States each year, extending hospital stays by 3.7 million extra days and generating more than \$1.6 billion in excess hospital charges each year¹. Surgical site infections are the third most frequently reported health care-associated infection (HAI) based on data derived from the Centers for Disease Control and Prevention's National Healthcare Safety Network². In order for a program to be the most effective in reducing the incidence of SSIs, your program should combine SSI-prevention methods and the WHO Surgical Safety Checklist, which promotes teamwork and communication in the operating room.

The Surgical Care Improvement Project (SCIP) developed in collaboration with the Centers for Medicare and Medicaid Services (CMS) was designed as an evidence-based process initiative to be applied broadly across selected surgical disciplines with a stated goal of reducing the morbidity and mortality of postoperative surgical site infections. The core process measures of this initiative includes: appropriate hair removal (clipping rather than shaving); appropriate antimicrobial prophylaxis involving timing (within 60 minutes of skin incision), choice of agent, and discontinuation within 24-hours; normalizing core body temperature within a defined time period postoperatively; and implementation of glycemic control measures in selective surgical patient populations. While the SCIP initiative has been successful in focusing healthcare professionals and institutions to improve postoperative patient outcomes, current peer publications would suggest that additional evidence-based interventions such as increasing perioperative antibiotic dosing, preadmission skin antisepsis and increasing O₂ tissue perfusion in the immediate postoperative period are representative examples of SCIP-Plus strategies for reducing risk and improving patient outcomes. These and other evidence-based interventional strategies will be discussed as a composite effort to enhance the impact of SCIP process measures in the elective surgical patient population.

These SCIP-Plus strategies combined with the WHO Safe Surgery Checklist will provide the foundation for your comprehensive SSI prevention program.

³Edmiston CE, Spencer M, Lewis BD, Brown KR, Rossi PJ, Hennen CR, Smith HW, Seabrook GR. Reducing the risk of surgical site infections: did we really think that SCIP would lead us to the promise land?" *Surgical Infection* 2011; 12:169-177.



¹Edmiston CE, Okoli O, Graham MB, Sinski S, Seabrook, GR. Improving surgical outcomes: an evidence-based argument for embracing a ChlorhexidineGluconate (CHG) preoperative shower (cleansing) strategy for elective surgical procedures. *AORNJ* 2010; 92:509-518. ² <u>http://www.cdc.gov/nhsn</u>

Surgical Site Infection and Safe Surgery Overview

Background:

- Worldwide there are approximately 234 million surgeries annually, now exceeding birth rates.
- In industrialized countries, it is estimated that 3 percent to 16 percent of surgeries experience a major complication with a perioperative inpatient surgery death rate of 0.4 to 0.8 percent.
- Nationally, the rate of surgical site infection averages between two to three percent for clean cases (Class I/Clean as defined by CDC), with an estimated 40 60 percent of these infections being potentially preventable.
- Studies show that patients with SSI have a longer stay by seven to 10 additional postoperative days and an added cost of approximately \$3,000 \$29,000 per SSI depending on the procedure and pathogen.
- Seventy-five percent of deaths among patients with surgical site infections are directly attributable to surgical site infections.

Suggested AIM:

• Reduce preventable surgical site infection rates by 20 percent by December 31, 2013

Potential Measures:

Outcome:Surgical site infection rate: (number of infections per 100 surgical procedures)Process:Percent of cases in which the Surgical Safety Checklist is used in its entirety and appropriately

Primary Drivers	Secondary Drivers
Adopt Surgical	✓ Conduct three pauses with surgical team at critical points:
Safety Checklist	- Before induction of anesthesia.
	- Before skin incision.
	- Before patient leaves the operating room.
	\checkmark Verbally confirm all items on the surgical checklist at each pause with appropriate surgical team
	members.
	 Ensure the use of a standard tool so as not to rely on memory for items in the surgical checklist.
Antimicrobial	\checkmark Develop standardized order sets for each procedure that include antibiotic, timing, dose and
Prophylaxis	discontinuation.
	✓ Develop pharmacist and nurse-driven protocols that ensure correct antibiotic selection based on
	type of surgery and patient characteristics (age, weight, etc.)
	✓ Create a process to review all exceptions to protocols.
	✓ Ensure that antibiotics are redosed appropriately in surgeries longer than four hours.
Perioperative Skin	✓ Develop standardized practices for application of skin antiseptic agents.
Antisepsis	✓ Educate perioperative personnel on the safe application of selective skin antiseptic agents.
Preadmission Skin	✓ Develop standardized order sets for preadmission skin cleansing.
Cleansing	✓ Develop a strategy for distribution of skin antiseptic agent to the patients.
	✓ Educate patients as to how to apply the skin antiseptic agent prior to hospital admission.
Normothermia in	✓ Develop standardized procedure for pre-warming for every surgical patient without a
the Operating Room	contraindication.
	\checkmark Develop standardized procedure for active warming in the operating room that could include
	warming blankets under patients on the operating table.
Perioperative	✓ Obtain glucometers for every anesthesia station.
Glucose Control	✓ Develop a perioperative glycemic control team that includes surgeons, anesthesiologists,
	endocrinologists and nurses to ensure that responsibility and accountability is assigned for blood
	glucose monitoring and control.

Making Changes:

• This intervention is in the Collaborative with Reducing Infections (Stay FIT Collaborative). National meetings, webinars, monthly coaching calls, change packages and other tools will augment state hospital association activities. The Collaborative will leverage the IHI Model for Improvement (Plan-Do-Study-Act)

Key Resources:

- <u>www.safesurgery2015.org</u>
- How-to Guide: Prevent Surgical Site Infections. Cambridge, MA: Institute for Healthcare Improvement; 2012: <u>http://www.ihi.org/knowledge/Pages/Tools/HowtoGuidePreventSurgicalSiteInfection.aspx</u>





Preparing the Skin Before Surgery

Preparing or "prepping" skin before surgery can reduce the risk of infection at the surgical site. To make the process easier, this facility has chosen disposable cloths moistened with a norinse, 2 percent Chlorhexidine Gluconate (CHG) antiseptic solution. The steps below outline the prepping process and should be carefully followed.

Night Before Surgery:

- Shower the night before surgery at least one hour before you prep your skin for the first time.
- Do not allow this product get into your eyes, ears, and mouth.
- Prep the skin as directed using 1st package of cloths.
- Stop use if redness or irritation occurs.
- Do not apply lotions, moisturizers or makeup after prepping.
- Dress in clean clothes/sleepwear.
- Remove the sticker from used package and apply to this form.



FRONT

Morning of Surgery:

- You may shower, wait one hour to prep skin.
- Prep skin as directed using second package of cloths.
- Do not apply lotions, moisturizers or makeup after prepping.
- Dress in clean clothes/sleepwear.
- Remove the sticker from used package and apply to this form.

Bring this form with you to your surgery.

How to Use Cloths:

- 1. Prep only the circled areas above
- 2. Scrub the skin back and forth for 3
- minutes with 1 cloth
- 3. Do not rinse
- 4. Allow to air dry
- 5. Discard each cloth after a single use
- 6. Repeat process with second cloth



Place sticker here

Place sticker here



SERVICE	ATTENDING	RESIDENT	SEE FOR ALLERGIES

OPERATING ROOM AND PRE-OP HOLDING INSULIN INFUSION PROTOCOL ORDERS Goal BG Range = 100-140 mg/dL

Discontinue All Previous Subcutaneous Insulin Orders

Standard insulin infusion: 100 units/100 mL 0.9% Sodium chloride via an infusion device

Confirm piggyback of 5% Dextrose at 100mL/hr is infusing $\mathbf{\nabla}$

Check blood glucose (BG) hourly

Treatment of Hypoglycemia (BG <70 mg/dL) or symptoms of hypoglycemia

- I Turn off insulin infusion for any BG below goal AND
- Give 25 mL (1/2 amp) of 50% dextrose IV if BG 50-69 mg/dL OR
- ☑ Give 50 mL (1 amp) of 50% dextrose IV if BG < 50 mg/dL.
 ☑ Recheck BG every 20 minutes until BG ≥100 mg/dL
- - → IF BG is <70 mg/dL repeat 25 mL (1/2 amp) 50% dextrose

→ WHEN BG is ≥100 mg/dL, restart the insulin infusion at a lower dose by using one algorithm LEFT from previous algorithm (see "Evaluating Trends & Using Algorithms" section).

Algor Start here f	rithm 1 or Type 1 DM	Algorithm 2 Start here for Type 2 DM		Algorithm 3 Do NOT Start here		Algorithm 4 Do not start here		
BG	Units/hr	BG	Units/hr	BG	Units/hr	BG	Units/hr	
		<70 = Hy	poglycemia (Se	e page 1 for t	reatment)		-0:	
		70-99	: Off x 20 mini	utes & rechec	k BG			
100-120	0.5	100-120	1	100-120	2	100-120	3	
121-140	0.8	121-140	1.5	121-140	2.5	121-140	4	
141-160	1.2	141-160	2	141-160	3	141-160	5.5	
161-180	1.5	161-180	2.5	161-180	4	161-180	7	
181-210	2	181-210	3	181-210	5	181-210	9	
211-240	2.5	211-240	4	211-240	6	211-240	12	
241-270	3	241-270	5	241-270	8	241-270	16	
271-300	3.5	271-300	6	271-300	10	271-300	20	
301-330	4	301-330	7	301-330	12	301-330	24	
331-360	4.5	331-360	8	331-360	14	>330	28	
>360	6	>360	12	>360	16			

Evaluating Trends & Using Algorithms:

Move right or left only one algorithm per BG check. Subtract current BG reading from previous BG reading for the change in BG.

BG in goal range:

o If BG has decreased ≥100 mg/dL in one hour, move LEFT one algorithm and use appropriate rate from table

If BG has decreased <100 mg/dL in one hour, maintain patient within current algorithm and adjust rate until patient is in goal 0 range for 4 hours

Once patient is within goal range for 4 hours, do NOT adjust rate unless BG exits goal range

 \square BG above goal range:

o If BG has not decreased by at least 60 mg/dL, move RIGHT one algorithm and use appropriate rate from table

o If BG has decreased by 60-100 mg/dL, stay within current algorithm and use appropriate rate from table

- If BG has decreased ≥100 mg/dL in one hour, move LEFT one algorithm and use appropriate rate from table 0
- Hypoglycemic event OR BG below goal range

Turn off insulin infusion. Treat hypoglycemia if BG<70mg/dL Recheck BG in 20 minutes.

Move LEFT one algorithm and use appropriate rate from table when BG returns to goal range.

						_
PHYSICIAN SIGNATURE	PRINT NAME	PAGER	UPIN/NPI	DATE	TIME	

Additional Resources

Antimicrobial Prophylaxis and Dosing (Additional Readings)

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Safe Surgery Driver Diagram

2012-2013



AIM: Reduce Preventable Surgical Site Infections by 20 percent by December 31, 2013.

Primary Drivers	Secondary Drivers	Tertiary Drivers (refer to companion guide, Safe Surgery Toolkit, for each step which contains templates, educational videos, presentations and slide sets)
STEP 1: Understand the background and the evidence behind the WHO Surgical Safety Checklist	 Learn the evidence behind the WHO Surgical Checklist. Learn the development and evolution behind the checklist creation. See a video demonstration of the checklist. Review the HRET Surgical Safety Checklist template. 	 Review the core principles behind this work. Review the topics of checklist creation, testing, impact and spread. View checklist demonstration video and testimonials from hospitals across the world. Download the HRET Surgical Safety checklist to serve as a starting point before customizing for your facility.
STEP 2: Engage in critical preparation before implementing the checklist	 Build a checklist implementation team Identify clinical champions. Schedule regular meetings with your checklist implementation team. Have the implementation team address OR personnel about using the checklist. Engage hospital leadership in this effort. 	 The team should consist of at least one administrator, anesthesia provider, circulating nurse, scrub tech and surgeon. Choose clinical champions that are well respected. Hold implementation team meetings once a week or every other week. Schedule a time and a venue for a meeting or repurpose an existing meeting where the implementation team can address as many OR personnel as possible. Think about which members of hospital leadership to engage; the most successful hospitals have support from <u>all</u> levels.
STEP 3: Modify and customize the checklist for your facility	 Each facility should modify or customize some sections of the checklist. Understand the considerations one must keep in mind while customizing the checklist. Ensure that modifications do not compromise the utility of the checklist. Ensure your checklist contains the critical elements. Review checklist templates for rapid turnover and cardiac surgery cases. 	 Learn the basic guidelines for checklist modification to help ensure that your modified checklist has the spirit of the WHO and South Carolina Checklists. Learn the process that your implementation team should follow when modifying the checklist for your hospital. Understand which sections can be modified and which sections should not be changed. Rapid turnover and cardiac surgery are two areas that may need unique checklists; to obtain copies of these checklist templates send an e-mail to <u>safesurgery2015@hsph.harvard.edu</u>.



Primary Drivers	Secondary Drivers	Tertiary Drivers (refer to companion guide, Safe Surgery
		Toolkit, for each step which contains templates, educational videos, presentations and slide sets)
STEP 4: Test the checklist	 ✓ Test your checklist with a "table-top simulation" with the implementation team. ✓ Have one surgical team use the checklist for one case. ✓ After one surgical team has used the checklist once, have one team use the checklist for every case for one day. 	 Collect feedback from table-top simulation test and incorporate into the next version of your checklist. Have one surgical team use the checklist for one case. If this is not the implementation team, talk to everyone that will be in the OR ahead of time about what the checklist is and test it with enthusiastic people. Collect feedback from this test and incorporate into your next version of the checklist. After one surgical team has used the checklist for every case for one day, modify the checklist as needed.
STEP 5: Engage surgical team members in this work	 ✓ Engage surgical team members in one-on-one conversations. ✓ Engage your colleagues by holding or repurposing meetings. ✓ Provide presentations to all surgeons. 	 Complete the OR personnel spreadsheet with everyone who will be touched by the checklist. Assign implementation team members to talk to everyone individually on the OR personnel spreadsheet. Pay attention to people you identified as skeptics. Talk one on one before a group meeting. Hold group meetings on the checklist and continue to talk one-on-one.
STEP 6: Plan the implementation	 ✓ Finalize your hospital's checklist. ✓ Decide if the checklist will be used in poster or paper form in your ORs. ✓ Advertise the checklist project in your hospital. ✓ Consider creating your own checklist video with surgical teams in your hospital using the checklist. 	 Review Toolkit Implementation Planning Basics, which include: How to accommodate feedback. Special things to keep in mind when planning checklist expansion in small hospitals. Special things to keep in mind when planning checklist expansion in medium to large hospitals. Getting your checklist ready for the rollout hospital wide.





Safe Surgery Toolkit

Please contact the Safe Surgery 2015 Team for help or if you have any questions:

Email: safesurgery2015@hsph.harvard.edu

Surgical care is responsible for a major portion of hospital admissions and expenditures. We are aware that more than 64,000,000 surgeries are performed every year in the United States.¹ Improving surgical care is vital and can make a significant impact on our patients' lives. Over the last 200 years major advances have been made in improving surgical safety, including advances in anesthesia and control of infection. Much less work has been done on improving communication and teamwork in the operating room. In spite of considerable understanding of best practices around infection prevention we often fail to bring those practices to our patients. Failures in communication and teamwork also play prominently when things in the operating room don't go as planned and result in patient injury. This Safe Surgery Program is a logical blend of work focused on both reducing infection and improving teamwork and communication in the operating room.

The WHO Surgical Safety Checklist is a simple tool that promotes communication and teamwork in the operating room. The checklist requires surgical team members to stop at three critical points during the case to discuss patient care as a team. Effective use of the checklist has been shown to demonstrably reduce avoidable surgical complications and death globally. The checklist was originally studied in an eight center multi-country pilot study and the results were published in the January 2009 New England Journal of Medicine Article, *A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population.* The use of the checklist reduced the rate of deaths and complications by more than one third. The rate of major inpatient complications also fell from 11 percent to 7 percent, and the inpatient death rate following major operations also fell from 1.5 percent to 0.8 percent after implementation of the checklist². More recently, articles have been published showing similar results in operating rooms in the United States and the Netherlands when operating room teams utilized a surgical checklist.^{3,4}

Today, the WHO Surgical Safety Checklist or a modified version of this tool is used in thousands of operating rooms in the United States and throughout the world. When the checklist is used effectively it benefits patients, improves communication and teamwork, strengthens the partnership between physicians and the hospital, increases staff retention, and improves staff satisfaction. Proper use of the checklist has also been shown to decrease the rate of surgical site infections.

While the checklist is a simple tool, putting it into place requires cultural and behavioral changes. The checklist is not simply a piece of paper, but it is a mechanism to improve teamwork in the operating room. If the checklist is used correctly it can help create an environment where all team members feel safe to voice concerns and contribute to patient care. This type of change requires input and involvement from every member of the surgical team. This cannot be accomplished by the nurses alone and will require the active involvement of physicians.

¹Weiser TG.Regenbogen SE. Thompson KD. Haynes AB. Lipsitz SR. Berry WR. Gawande AA. <u>An estimation of the</u> <u>global volume of surgery: a modelling strategy based on available data.</u> The Lancet. 2008; 372: 139-144.

² Haynes AB et al. A surgical safety checklist to reduce morbidity and mortality in a global population. N Engl J Med. 2009 Jan 29;360(5):491-9. Epub 2009 Jan 14.

³Neily J, Mills PD, Young-Xu Y, Carney BT, West P, Berger DH, Mazzia LM, Paull DE, Bagian JP. Association between implementation of a medical team training program and surgical mortality.JAMA. 2010 Oct 20; 304(15):1693-700.

⁴vanKlei WA, Hoff RG, van Aarnhem EE, Simmermacher RK, Regli LP, Kappen TH, van Wolfswinkel L, Kalkman CJ, Buhre WF, Peelen LM. Effects of the Introduction of the WHO "Surgical Safety Checklist" on In-Hospital Mortality: A Cohort Study. Ann Surg. 2012 Jan;255(1):44-9

This toolkit includes materials that are used as part of the Safe Surgery 2015 Initiative. The Safe Surgery 2015 initiative is based at the Harvard School of Public Health and was developed to measurably reduce surgical infections, major complications, and death through effective population-wide implementation of the WHO Surgical Safety Checklist Program. The goal is to implement the checklist in every hospital in the United States by 2015. We launched our efforts in the state of South Carolina where all of the hospitals have committed to putting the checklist into routine use in their operating rooms by the end of 2013. To learn more about the Safe Surgery 2015 Initiative please visit www.safesurgery2015.org.

We invite you to join us on this journey to improve surgery for our patients. Putting the checklist into place will take time, but if done correctly, it can change the way team members interact with one another and ensure that our patients receive the best care possible. This toolkit walks you through the essential steps of putting the checklist into place and how to overcome barriers that you may face with this work.

Step 1 - Checklist Background:

Before you start to work on the checklist it is important to know the checklist background and the evidence that is behind this tool. These materials will prepare you to start working on this project.

	Core Principles Behind	To view this short overview:
	This Work	http://youtu.be/KaCfzQh042M
	This three-minute video	To view this entire presentation:
	clip summarizes the	http://harvardsph.webex.com/harvardsph/lsr.php?AT=pb
	overarching principles of	<u>&SP=EC&rID=48606007&rKey=06bff5928ff6864c%20%20</u>
	this project and how the	To download the slides from this presentation:
	checklist is different from	http://www.safesurgery2015.org/uploads/1/0/9/0/1090
	other quality	<u>835/call_7.ppt</u>
	improvement efforts.	
	Checklist Development	To view this short overview:
	This 24-minute video	http://youtu.be/rqHsFo3CoCk
	describes the	To view this entire presentation:
	development and	http://harvardsph.webex.com/harvardsph/lsr.php?AT=pb
Video Overviews	evolution of the checklist.	<u>&SP=EC&rID=47856157&rKey=4df27050517e53d4%20%</u>
	Topics that are covered	<u>20</u>
	include: checklist	To download the slides from this presentation:
	creation, testing, impact	http://www.safesurgery2015.org/uploads/1/0/9/0/1090
	of the checklist, spread of	<u>835/call_1.ppt</u>
	the checklist, background	
	of the South Carolina	
	Checklist template.	
	Safe Surgery 2015:	To view checklist demonstration videos:
	Checklist Videos	http://www.safesurgery2015.org/checklist-videos.html
	Checklist demonstration	
	videos and testimonials	
	created by hospitals	
	across the world.	
		To download this document:
		http://www.safesurgery2015.org/uploads/1/0/9/0/1090
		<u>835/checklist_references_4-12-12.doc</u>
	Checklist Bibliography	
	A comprehensive	
Documents	bibliographical record of	
	checklist evidence and	
	related articles.	
	HRET Surgical Safety	To download this document:
	Checklist Template	http://www.safesurgery2015.org/uploads/1/0/9/0/1090
	Use this checklist	835/cnecklist_template_hret_3-30-12.doc
	template as a starting	
	point for this work. This	
	template has been	
	modified specifically for	

Documents	hospitals in the United
	States. This checklist was
	developed by hospitals
	that participated in the
	Safe Surgery 2015: South
	Carolina initiative.

Step 1 - Action ItemsAfter reviewing the videos and documents in this section please complete the following action items.1.Review the evidence that is behind the WHO Surgical Safety Checklist.

- 1.
- 2. Review the HRET Surgical Safety Checklist Template.

Step 2 – Critical Preparation:

Before you start spreading the checklist in your operating rooms it is essential to prepare for this project and to think about issues that you might face when you start doing this work. The following materials will walk you through building a checklist implementation team to lead this project, assessing current safety practices in your operating rooms, measuring checklist impact, the checklist as a documentation tool, malpractice concerns, and engaging executive leadership in this work.

		To view this short overview:
	Building an Implementation	http://youtu.be/GRa5EOwMhp4
	Team	To view this entire presentation:
	This eight-minute video	https://harvardsph.webex.com/harvardsph/lsr.php?AT=pb&S
	discusses the first and one of	P=TC&rID=51412182&rKey=0148dd36445426f5&act=pb
Video	the most important steps when	To download the slides from this presentation:
Overviews	starting to do this work. This	http://www.safesurgery2015.org/uploads/1/0/9/0/1090835
	clip also discusses how to	<u>/call 2 -</u>
	identify clinical champions.	who checklist background and implementation team final fi
		<u>nal.ppt</u>
		To view this short overview:
	We're Already Doing All of	http://voutu.be/gwCHpUrvM80
	This	To view this entire presentation:
	This two-minute clip discusses	http://harvardsph.webex.com/harvardsph/lsr.php?AT=pb&S
	one of the most common	P=EC&rID=48122772&rKev=0a86fbd6b6a92bc7%20%20
	objections to using the	To download the slides from this presentation:
	checklist.	http://www.safesurgery2015.org/uploads/1/0/9/0/1090835
		/culture survey administration - web.ppt
	Checklist as a Documentation	To view this short overview: http://youtu.be/8b27Sfl3RXs
	Tool	To view this entire presentation:
	This four-minute clip discusses	https://harvardsph.webex.com/harvardsph/lsr.php?AT=pb&S
	whether the checklist should be	P=TC&rID=51839747&rKey=8eb7cb8450fcb3fe&act=pb
	used as a documentation tool	To download the slides from this presentation:
	and included in the medical	http://www.safesurgery2015.org/uploads/1/0/9/0/1090835
	record.	/call 5 table top simulation web-ready.pptx
	Understanding Checklist	To view this short overview: <u>http://youtu.be/e6SzD6I5tik</u>
	Impact and Measurement	To view this entire presentation:
	This eight-minute clip discusses	https://harvardsph.webex.com/harvardsph/lsr.php?AT=pb&S
	the best ways to measure the	P=TC&rID=53538532&rKey=f672528fa27e8d94&act=pb
	impact of the checklist. This clip	To download the slides from this presentation:
	also discusses barriers to	http://www.safesurgery2015.org/uploads/1/0/9/0/1090835
	measuring the checklist in your	/call 16 - measuring the checklist and feedback -
	hospital.	web ready.ppt
		To view this short overview: <u>http://youtu.be/eP_zpdxaLy8</u>
		To view this entire presentation:
	Malpractice Issues Related to	https://harvardsph.webex.com/harvardsph/lsr.php?AT=pb&S
	Checklist	P=TC&rID=51839747&rKey=8eb7cb8450fcb3fe&act=pb
	This five-minute clip discusses	To download the slides from this presentation:
	frequently asked questions	http://www.safesurgery2015.org/uploads/1/0/9/0/1090835
	about checklist use and	/call_5_table_top_simulation_web-ready.pptx
	malpractice issues.	
	-	

Video Overview	What the Checklist Is and Isn't This three-minute clip provides a brief overview of how to properly use the checklist.	To view this short overview: http://youtu.be/hRtcYlHeFs8 To view this entire presentation: https://harvardsph.webex.com/harvardsph/lsr.php?AT=pb&S P=TC&rID=51721607&act=pb&rKey=370a7b001e4dc662 To download the slides from this presentation: http://www.safesurgery2015.org/uploads/1/0/9/0/1090835 /webinar 4 checklist modification web-ready.pptx
Documents	Are We a Safe Surgery 2015 Hospital? If you think that your hospital optimally uses the checklist and has achieved an effective and full implementation we encourage you to use this document to see if you meet the standards of Safe Surgery 2015.	To download this document: http://www.safesurgery2015.org/uploads/1/0/9/0/1090835 /are_we_a_safe_surgery_2015_4-10-12.doc
	CEO One Pager Engaging executive leadership is key. This document explains the basics of the project in a one-page summary designed specifically for distribution to hospital CEO's.	To download this document: http://www.safesurgery2015.org/uploads/1/0/9/0/1090835 /ceo_one_pager_4-10-12.doc

Step 2 – Action Items

After reviewing the videos and documents in this section please complete the following action items.

1. Build an implementation team that consists of at least one administrator, anesthesia provider, circulating nurse, scrub tech and surgeon.

2. Schedule regular meetings with your checklist implementation team (once every week or every two weeks) and begin meeting with the members.

3. Think about and discuss how the checklist fits in with the current OR processes with members of your checklist implementation team. Consider comparing what happens in your ORs with the items that are outlined on the "Are We a Safe Surgery 2015 Hospital" document.

•

4. Schedule a time and venue for a meeting, or repurpose existing departmental meetings where the implementation team will be able to talk to as many OR personnel including anesthesia providers, nurses, surgeons and techs about using the checklist at your hospital. These meetings should be scheduled about six to 10 weeks from when you start this work to coincide with your checklist launch/roll-out.

5. Think about which members of hospital leadership need to be engaged in this project. It is helpful to have the CEO, CMO, board members, and chiefs of surgery, anesthesia, nursing, and other medical and administrative leadership aware and on some level supporting this project. These individuals do not need to be part of your checklist implementation team, but need to actively support this work and be updated on the progress that you are a making as well as the barriers that you are facing. The most successful hospitals have support for this project at <u>ALL</u> levels.

Step 3 – Checklist Modification and Customization

Modifying the checklist is essential to ensuring that the checklist meets the needs of an individual hospital. We recommend that every hospital modify the checklist in some way, even if it is just putting your hospital's logo on it. The following documents will guide you through this process and provide you with the information that you will need to modify the checklist to meet your unique needs.

	Modification 101	To view this short overview:
	This 10-minute clip discusses	http://youtu.be/soT899yyL5A
	how and why to modify the	To view this entire presentation:
	checklist. We recommend that	https://harvardsph.webex.com/harvardsph/lsr.php?AT
	every hospital modify the	<u>=pb&SP=TC&rID=51721607&act=pb&rKey=370a7b001</u>
	checklist in some capacity.	<u>e4dc662</u>
	These basic guidelines will help	To download the slides from this presentation:
	you ensure that your modified	http://www.safesurgery2015.org/uploads/1/0/9/0/10
	checklist has the spirit of the	90835/webinar 4 checklist modification web-
Video	WHO and South Carolina	<u>ready.pptx</u>
Overview	checklists.	
		To view this short overview:
	Process to Follow When	http://youtu.be/QF9IXXPy6vw
	Modifying the Checklist	To view this entire presentation:
	This four-minute clip describes	https://harvardsph.webex.com/harvardsph/lsr.php?AT
	the process that you and your	<u>=pb&SP=TC&rID=51839747&rKey=8eb7cb8450fcb3fe&</u>
	implementation team should	<u>act=pb</u>
	follow when modifying the	To download the slides from this presentation:
	checklist for your hospital.	http://www.safesurgery2015.org/uploads/1/0/9/0/10
		<u>90835/call 5 table top simulation web-ready.pptx</u>
	Checklist Modification Guide	To download this document:
	This document outlines the	http://www.safesurgery2015.org/uploads/1/0/9/0/10
	considerations one must keep	90835/modification document 4-10-12.doc
	in mind while customizing the	
	checklist in order to ensure that	
	modifications do not	
	compromise the utility of the	
	tool.	
	HRET Surgical Safety	To download this document:
	Checklist Template	http://www.safesurgery2015.org/uploads/1/0/9/0/10
	This checklist template includes	<u>90835/checklist template nret 3-30-12.doc</u>
Documents	the items from the joint	
	Commission, SCIP Items, as well	
	as items to enhance	
	communication and teamwork.	To download this dogwoont
	boes Our Checklist Contain	10 download this document: http://www.cofegurgeny2015.org/uploads/1/0/0/0/10
	This document will help oncure	<u>IIIIp://www.salesurgery2015.01g/uploaus/1/0/9/0/10</u>
	that your quatomized sheaklist	<u>4 10 12 dow</u>
	contains the items that are	<u>4.10.12.000x</u>
	contains the items that are	
	teamwork and communication	
	in the operating room	
	in the operating room.	

Checklist Templates for	Please send us an email at:
Rapid Turnover and Cardiac	safesurgery2015@hsph.harvard.edu to obtain copies of
Surgery Cases	these two checklist templates.
Some of the videos on	
modification briefly highlight	
checklist templates that have	
been designed and tested for	
rapid turnover and cardiac	
surgery cases. We believe that	
these two areas may need	
unique checklists to best suit	
this environment.	

Step 3 – Action Items:

After reviewing the videos and documents in this section please complete the following action items. 1. Modify the checklist with your implementation team. When doing this make sure that a representative from every discipline has an opportunity to participate in this discussion. Remember to keep the communication items.

2. Make sure that your checklist contains the elements that are outlined in the document, "Does Our Checklist Contain the Critical Elements" document.

Step 4 - Testing the Checklist

We recommend testing the checklist before you use it in an operating room with a patient. The following materials will walk you through the essential steps of testing the checklist from testing the checklist with a "table-top simulation" to using it in the OR for the first time.

	Testing the Checklist and a	To view this short overview:
	Demonstration of using the checklist in a	http://youtu.be/MAjRH3TGyAU
	Table-Top Simulation	To view this entire presentation:
	This 14-minute clip explains the importance	http://harvardsph.webex.com/harvardsph/lsr.p
	of testing the checklist outside of the OR and	hp?AT=pb&SP=EC&rID=48606007&rKey=06bff5
	includes a demonstration of how to use the	<u>928ff6864c%20%20</u>
	checklist in a table-top simulation.	To download the slides from this presentation:
		http://www.safesurgery2015.org/uploads/1/0/
		<u>9/0/1090835/call_7.ppt</u>
	Taking the Checklist into the Operating	To view this short overview:
Video	Room for the First Time	http://youtu.be/sb9BBnllPO4
Overviews	How to display the checklist in the OR	To view this entire presentation:
Overviews	during testing and a brief overview of ways	https://harvardsph.webex.com/harvardsph/lsr.
	of displaying the checklist when you expand	php?AT=pb&SP=TC&rID=51963077&act=pb&rK
	the use of the checklist to your entire OR	<u>ey=002d130428862c2f</u>
	suite.	To download the slides from this presentation:
		http://www.safesurgery2015.org/uploads/1/0/
		9/0/1090835/call 6 testing the checklist in the
		<u>or.pptx</u>
	Safe Surgery 2015: Checklist Videos	To view checklist demonstration videos:
	Checklist demonstration videos and	http://www.safesurgery2015.org/checklist-
	testimonials created by hospitals around the	<u>videos.html</u>
	world.	

Step 4 – Action Items:

After reviewing the videos and documents in this section please complete the following action items. 1. Test your checklist in a "table-top simulation" with members of the checklist implementation team. Collect feedback from this test and incorporate it into the next version of your checklist.

2. Have one surgical team use the checklist for one case. If this team does not include everybody from the checklist implementation team, remember to talk to everybody who will be in the OR ahead of time about what the checklist is and test it with enthusiastic people. Collect feedback from this test and incorporate it into your next version of the checklist.

3. After the one surgical team has used the checklist once, have one team use the checklist for every case for one day and modify the checklist as necessary. If this team does not include everybody from the checklist implementation team, remember to talk to everybody who will be in the OR ahead of time about what the checklist is and test it with enthusiastic people. Collect feedback from this test and incorporate it into your next version of the checklist.

Step 5 – Engaging Surgical Team Members in This Work

In order to achieve an effective checklist implementation it is essential to talk to **everybody** who will be touched by the checklist. Every person needs to know what the checklist is, why it is important for them to use it, and how the checklist should be used before they use it for the first time. We recommend that checklist implementation teams have one-on-one conversations with as many people as they can. Make every effort to ensure that everybody knows about the checklist before you ask them to use the checklist in the OR. We believe that this is one of the most important things that you can do when putting something like the checklist into place. The following resources will walk you through engaging your colleagues with one-on-one conversation and repurposing meetings.

	Engaging Surgical Team Members This 18-minute clip provides an overview of the importance of engaging everybody that will be touched by this project. This is one of the most important things that you can do to make the checklist successful in your operating rooms.	To view this short overview: http://youtu.be/CLN9fU342os To view this entire presentation: http://harvardsph.webex.com/harvardsph/lsr.p hp?AT=pb&SP=EC&rID=48723182&rKey=076e6 bd94034c93e%20 To download the slides from this presentation: http://www.safesurgery2015.org/uploads/1/0/ 9/0/1090835/call 8 wave 1 engaging surgical t eams_final.ppt
Video Overviews	How To Engage Everybody with a One- on-One Conversation This two-minute clip talks about how to conduct one-on-one conversations.	To view this short overview: http://youtu.be/fXUHDm7y918 To view this entire presentation: https://harvardsph.webex.com/harvardsph/lsr. php?AT=pb&SP=TC&rID=52564712&rKey=06d0 2e106c91cfa4&act=pb To download the slides from this presentation: http://www.safesurgery2015.org/uploads/1/0/ 9/0/1090835/call_9_engaging_your_colleagues_c ontinued_final.pptx
	Engaging Your Colleagues By Holding or Repurposing Meetings This nine-minute clip discusses the importance of talking about the checklist at large meetings and provides tips on how to best present the checklist.	To view this short overview: http://youtu.be/IF9yIhgg2UQ To view this entire presentation: http://harvardsph.webex.com/harvardsph/lsr.p hp?AT=pb&SP=EC&rID=49001367&rKey=a548c a71f15dcc5b%20%20 To download the slides from this presentation: http://www.safesurgery2015.org/uploads/1/0/ 9/0/1090835/preparation for expanding to full implementation.webready.ppt
Video Overviews	Presentations for Surgeons This 11-minute presentation is a demonstration of how to present the checklist to surgeons. We recommend everybody watch this clip before talking to surgeons about this project.	To view this short overview: http://youtu.be/F ym0FMkxwI To view this entire presentation: https://harvardsph.webex.com/harvardsph/lsr. php?AT=pb&SP=TC&rID=52564712&rKey=06d0 2e106c91cfa4&act=pb To download the slides from this presentation: http://www.safesurgery2015.org/uploads/1/0/ 9/0/1090835/call 9 engaging your colleagues c

	Operating Room Personnel Spreadsheet	To download this document:
	This spreadsheet was designed to track	http://www.safesurgery2015.org/uploads/1/0/
	which surgical team members have been	9/0/1090835/contact_information_template.xls
	engaged in one-on-one conversations.	X
	One-on-One Conversation Guide	To download this document:
Documents	This conversation guide is designed to offer	<u>http://www.salesuigery2015.01g/upi0aus/1/0/</u>
	discussion points for talking to colleagues.	<u>9/0/1090835/00e-00-</u>
		One conversation guide 4.10.12.doc
	Large Multi-Disciplinary Meeting	To download this document:
	Presentation Template	http://www.safesurgery2015.org/uploads/1/0/
	This presentation template is designed for	<u>9/0/1090835/large_meeting_presentation_4-10-</u>
	the large meeting that should be held in	<u>12ppt.ppt</u>
	your hospital to inform colleagues on details	
	of this project.	
Documents	Talking to Anesthesia Providers	To download this document:
Documents	Presentation Template	http://www.safesurgery2015.org/uploads/1/0/
	This presentation template is designed	<u>9/0/1090835/anesthesiologist template 4-10-</u>
	specifically for use in talking with anesthesia	<u>12ppt.ppt</u>
	providers about the checklist.	
	Talking to Nurse and Surgical Tech	To download this document:
	Colleagues Presentation Template	http://www.safesurgery2015.org/uploads/1/0/
	This presentation template is designed	<u>9/0/1090835/nurse_and_scrub_tech_4-10-</u>
	specifically for use in talking with your	<u>12ppt.ppt</u>
	nurse and surgical tech colleagues about the	
	checklist.	
	Talking to Surgeons Presentation	To download this document:
	Template	http://www.safesurgery2015.org/uploads/1/0/
	This presentation template is designed	<u>9/0/1090835/surgeon template 4-10-12ppt.ppt</u>
	specifically for use in talking with surgeons	
	about the checklist.	

Step 5 – Action Items:

After reviewing the videos and documents in this section please complete the following action items. 1. Complete the operating room personnel spreadsheet with everyone who will be touched by the checklist. Identify people that you think will be skeptical of using the checklist. Use this to guide your conversations with your colleagues.

2. Use the OR personnel list that you created and assign members of the implementation team to talk to everybody individually over the next couple of weeks. If possible, talk to the people that you identified as possible skeptics. Make sure that you talk with them one-on-one prior to when you hold the large meeting.

3. Start talking to your colleagues in one-on-one conversations.

Step 6 - Implementation Planning

Planning the expansion of the checklist is critical. We recommend that you and your checklist implementation team discuss how to best expand the use of the checklist. Always remember to start where it is easy and where you have the most buy-in. The following materials will walk you through planning the checklist roll-out from what to think about to advertising the checklist at your hospital.

Video Overviews	Implementation Planning Basics This seven-minute clip discusses planning for checklist expansion. Planning and picking the right teams to start with is crucial to making the checklist work in your ORs. Accommodating Feedback This six-minute clip discusses the importance of having somebody available for questions and concerns when expanding the use of the checklist and how to use short surveys to collect feedback on how it is going. This clip also discusses the critical importance of fixing problems that are raised during the debriefing section. The most successful hospitals create systems to collect feedback collected during the debriefing and have a way of fixing the problem and following up with front line clinicians.	To view this short overview: http://youtu.be/DAGxWE0a7BQ To view this entire presentation: https://harvardsph.webex.com/harvardsph/lsr.php? AT=pb&SP=TC&rID=52934062&rKey=ebb3bb62fe0 481eb&act=pb To download the slides from this presentation: http://www.safesurgery2015.org/uploads/1/0/9/0 /1090835/call 11 - preparation for expansion planning.pptx To view this short overview: http://youtu.be/ZEd7iGWtBmY To view this entire presentation: https://harvardsph.webex.com/harvardsph/lsr.php? AT=pb&SP=TC&rID=52934062&rKey=ebb3bb62fe0 481eb&act=pb To download the slides from this presentation: http://www.safesurgery2015.org/uploads/1/0/9/0 /1090835/call 11 - _preparation for expansion planning.pptx
	Special Things to Keep in Mind When Planning Checklist Expansion in Small Hospitals This video clip explains how to plan your implementation in a small-sized hospital.	To view this short overview: <u>http://youtu.be/I3Z0MGcqyu4</u> To view this entire presentation: <u>https://harvardsph.webex.com/harvardsph/lsr.php?</u> <u>AT=pb&SP=TC&rID=52934062&rKey=ebb3bb62fe0</u> <u>481eb&act=pb</u> To download the slides from this presentation: <u>http://www.safesurgery2015.org/uploads/1/0/9/0</u> <u>/1090835/call_11</u> _preparation for expansion planning.pptx
Video Overviews	Special Things to Keep in Mind When Planning Checklist Expansion in Medium to Large Hospitals This video clip explains how to plan your implementation in a medium to large- sized hospital.	To view this short overview: http://youtu.be/H0tNTQsU8us To view this entire presentation: https://harvardsph.webex.com/harvardsph/lsr.php? AT=pb&SP=TC&rID=52934062&rKey=ebb3bb62fe0 481eb&act=pb To download the slides from this presentation:

	http://www.safesurgery2015.org/uploads/1/0/9/0 /1090835/call_11 preparation for expansion planning ppty
Getting Your Checklist Ready for the Roll-Out This short video provides some tips and things for you think about before you print checklists for the roll-out	To view this short overview: http://youtu.be/8eYLDx8WdfA To view this entire presentation: https://harvardsph.webex.com/harvardsph/lsr.php? AT=pb&SP=TC&rID=52811927&rKey=047e27691b2 0474c&act=pb To download the slides from this presentation: http://www.safesurgery2015.org/uploads/1/0/9/0 /1090835/call 10 - _preparation for expansion advertizing the checklis t_web-ready.pptx

Step 6 – Action Items:

After reviewing the videos and documents in this section please complete the following action items. 1. Finalize your hospital's checklist.

2. Decide if the checklist will be used in poster or paper form in your ORs. If your hospital will be using posters, look into options for having them made.

3. Advertise the checklist project in your hospital.

4. Consider creating a checklist video with surgical teams at your hospital using the checklist. This is a great tool to teach teams how to use the checklist.

5. Hold the large meetings that you scheduled at the beginning of this project.

6. Prioritize surgical specialties for the roll-out using your knowledge of which surgeons will be most receptive to the checklist. Create a timeline for your hospital's expansion.

7. Start implementing the checklist over the next week with the service that you think will be most willing to use the checklist.

8. Set up a system to collect feedback from surgical teams about the checklist and how it is going.

9. Decide how you will monitor checklist impact.

10. Work with your checklist implementation team to develop a way to advertise anything that the checklist catches in your hospital. Consider talking to patients about the checklist and advertising the checklist in waiting rooms.

Step 7 – Sustaining Checklist Use

Congratulations, you have put the checklist into your operating rooms. Ensuring that the checklist is used appropriately over time is challenging. The following materials will provide you with an overview of some ways to ensure that checklist use is sustained in your operating rooms over time.

	Revisiting Checklist Impact and Measurement This is a seven-minute review of the best way to measure the impact that the checklist has in your operating rooms.	To view this short overview: <u>http://youtu.be/e6SzD6I5tik</u> To view this entire presentation: <u>https://harvardsph.webex.com/harvardsph/lsr.php?AT=p</u> <u>b&SP=TC&rID=53538532&rKey=f672528fa27e8d94&act=</u> <u>pb</u> To download the slides from this presentation: <u>http://www.safesurgery2015.org/uploads/1/0/9/0/1090</u> <u>835/call 16 - measuring the checklist and feedback -</u> <u>web ready.ppt</u>
Video Overviews	Becoming a Checklist Coach This 10-minute clip is an overview of how to improve checklist performance through coaching in the operating room.	To view this short overview: http://youtu.be/yfCayGUDzYE To view this entire presentation: https://harvardsph.webex.com/harvardsph/lsr.php?AT=p b&SP=TC&rID=53300577&rKey=9e83c808015b8111&act =pb To download the slides from this presentation: http://www.safesurgery2015.org/uploads/1/0/9/0/1090 835/call 14 coaching in the or.ppt
	Tips for Sustaining Checklist Use This six-minute clip shares tips and tricks for successfully sustaining the use of the checklist in your operating rooms.	To view this short overview: <u>http://youtu.be/WBPbbwiYV90</u> To view this entire presentation: <u>https://harvardsph.webex.com/harvardsph/lsr.php?AT=p</u> <u>b&SP=TC&rID=53762482&rKey=29df4fe4e07ff536&act=p</u> <u>b</u> To download the slides from this presentation: <u>http://www.safesurgery2015.org/uploads/1/0/9/0/1090</u> <u>835/call 18 final call - web ready.pptx</u>
Video Overviews	A Look Into The Future This clip discusses barriers that hospitals face after they initially put the checklist into place.	To view this short overview: http://youtu.be/l-ia40tuhDI To view this entire presentation: http://harvardsph.webex.com/harvardsph/lsr.php?AT=pb &SP=EC&rID=50003912&rKey=b0aaa3459560a5f6%20 To download the slides from this presentation: http://www.safesurgery2015.org/uploads/1/0/9/0/1090 835/call_16are_you_where_you_want_to_be.ppt

Step 7 – Action Items:

After reviewing the videos and documents in this section please complete the following action items. 1. Identify individuals in your hospital who can serve as coaches in the operating room and have them observe and coach teams using the checklist.

2. Never stop looking at how teams use the checklist. Continue to monitor checklist use and collecting feedback from surgical teams about how it is going and what could be improved.

3. Consider having conversations with front-line staff, including physicians and ask them how it is going.

4. Continue to update hospital leadership on checklist use.



Implementation Guide to Prevention of Ventilator-Associated Pneumonia (VAP)

HRET Contact <u>hen@aha.org</u> (312) 834-7056 <u>www.hret-hen.org</u>



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Prevention of Ventilator Associated Pneumonia Overview

Background:

- Ventilator Associated Pneumonia (VAP) is a high-risk disease for patients on mechanical ventilation. Attributable mortality may be as high as 40%.
- VAP is the leading cause of death among hospital-acquired infections, exceeding the rate of death due to central line infections, severe sepsis, and respiratory tract infections in the non-intubated patient.
- VAP also prolongs time spent on the ventilator, length of ICU stay, excess use of antimicrobial medications and length of hospital stay after discharge from the ICU.
- For 2010, NHSN facilities reported more than 3,525 VAPs and the incidence for various types of hospital units ranged from 0.0-5.8 per 1,000 ventilator days.
- The total annual direct medical costs for VAP in United States hospitals is \$1.03 billion to \$1.50 billion.

Suggested AIM:

Decrease the rate of VAP to a state median of 0.0/1,000 ventilator days for at least 6 months by December 31, 2013

Potential Measures:

Outcome:VAP rate (number of VAPs per 1,000 ventilator days) for ICU and high-risk nursery (HRN) patientsProcess:Ventilator Bundle Compliance (individual bundle element compliance, all-or-none bundle element compliance)

Primary Drivers	Secondary Drivers
Elevate Head of Bed	✓ Use visual cues so it is easy to identify when the bed is in the proper position, such as a line on the wall
raised between 30-	that can only be seen if the bed is below a 30-degree angle.
45 degrees	✓ Include the clues on order sets for initiation and weaning of mechanical ventilation, delivery of tube
	feedings, and provision of oral care.
	 Create an environment where respiratory therapists work collaboratively with nursing to maintain head-
	of-the-bed elevation.
Peptic ulcer disease	✓ The use of medications (H2 blockers are preferred over sucralfate). Proton pump inhibitors may be
(PUD) prophylaxis	efficacious and an alternative to sucralfate or H2 antagonist.
	 Include PUD on the ICU order admission set and ventilator order set.
	 Incorporate review of PUD into daily multidisciplinary rounds.
	 Engage pharmacy in daily multidisciplinary rounds to ensure ICU patients have some form of PUD and VTE
	prophylaxis.
Venous	 Initiate VTE prophylaxis on all mechanically ventilated patients unless contraindicated.
Thromboembolism	 Include VTE prophylaxis as part of your ICU order admission set and ventilator order set.
(VTE) prophylaxis	
Spontaneous	✓ Develop protocols, order sets, and standard work for spontaneous swakening trials (SAT) and spontaneous
Awakening Trials	breathing trial (SBT)
(SAT) and	 Perform daily assessments of readiness to wean and extubate.
Spontaneous	 Create an environment where respiratory therapists work collaboratively with nursing to facilitate a daily
Breathing Trials (SBT)	"sedative interruption" in coordination to "weaning trials."
	✓ Implement a protocol to lighten sedation daily to assess for readiness to extubation. Include precautions
	to prevent self-extubation such as increased monitoring during the trial.
Oral Care	✓ Perform regular oral care with an antiseptic solution, e.g. chlorhexidine, in accordance with the
	manufacturer's product guidelines.
	✓ Include daily oral care with chlorhexidine as part of your ICU order admission set and ventilator order set
	 Educate the RN staff about the rationale for supporting good oral hygiene and its potential benefit in
	reducing ventilator-associated pneumonia.

Making Changes:

This intervention is in the <u>Collaborative with Reducing Infections</u> (**Stay FIT Collaborative**). National meetings, webinars, monthly coaching calls, change packages and other tools will augment state hospital association activities.

Key Resources:

- CDC Guidelines for Preventing VAP: <u>http://www.cdc.gov/mmwr/preview/mmwrhtml/00045365.htm</u>
- Society of Hospital Medicine Guidelines for Preventing VAP : http://www.hospitalmedicine.org/AM/Template.cfm?Section=CME&Template=/CM/HTMLDisplay.cfm&ContentID=4124
- IDSA and SHEA Compendium on VAP: <u>http://www.jstor.org/stable/10.1086/591062</u>
- IHI How to Guide Preventing VAP: http://www.ihi.org/knowledge/Pages/Tools/HowtoGuidePreventVAP.aspx



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Prevention of Ventilator Associated Pneumonia (VAP) Driver Diagram 2012-2013

AIM: Decrease the rate of VAP to a state median of 0.0/1,000 ventilator days for at least 6 months by December 31, 2013.

Primary Drivers	Secondary Drivers	Change Ideas
Elevate Head of Bed raised between 30-45 degrees.	 Use visual cues so it is easy to identify when the bed is in the proper position. Identify one person to check for visual cues every one to two hours in the entire unit. Include the cues on order sets for initiation and weaning of mechanical ventilation, delivery of tube feedings, and provision of oral care. Educate patients and their families on the importance of keeping the head of the bed elevated. 	 Use a line (red tape) on the wall that can only be seen if the bed is below a 30-degree angle. A string hanging on the side of the bed to show the correct angle. Assign respiratory therapy staff or unit assistant to look for visual cues every one to two hours. If computerized, use a pop-up reminder that is computer based. Include the intervention on nursing flow sheets. Discuss during multidisciplinary rounds. Include HOB elevation in charge nurse rounds. Charge nurse can provide just in time training, if charge nurses are utilized.
Peptic ulcer disease (PUD) prophylaxis	 Use appropriate medications Include PUD on the ICU order admission set and ventilator order set. Engage pharmacy to ensure ICU patients have some form of PUD prophylaxis (redundancy, failure remediation) Include PUD Rx on daily checklist. 	 H2 blockers are preferred over sucralfate. Proton pump inhibitors may be efficacious, and an alternative to sucralfate or H2 antagonist. Discuss during multidisciplinary rounds. Include PUD in charge nurse rounds. Charge nurse can provide just in time training and assist bedside nurse in obtaining order for PUD, if charge nurses are utilized.
Venous Thromboembolism (VTE) prophylaxis	 Initiate VTE prophylaxis unless the patient is contraindicated. Engage pharmacy to ensure ICU patients have some form of PUD prophylaxis redundancy, failure remediation. Include VTE Rx on daily checklist. 	 Include VTE prophylaxis as part of your ICU order admission set and ventilator order set. Include VTE in all ICU rounds. Nurse leaders can provide just in time training and assist bedside nurse in obtaining order for VTE prophylaxis.
Spontaneous awakening trials (sedation vacation)/ spontaneous breathing trials	 Develop protocols, order sets, and standard work for spontaneous awakening trials (SAT – also called sedation interruption or vacation) and a spontaneous breathing trial (SBT). Coordinate SAT and SBT to maximize weaning 	 Perform daily assessments of readiness to wean and extubate. Provide a daily reduction or removal of sedative support. Consider one time of day that the SAT and SBT are attempted. Coordinate between nursing and respiratory therapy on managing SAT and SBT. Use white boards, EMR or other



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Implementation Guide to Prevention of Ventilator-Associated Pneumonia (VAP) 6

Primary Drivers	Secondary Drivers	Change Ideas
	 opportunities when patient sedation is minimal. Sedation should be goal oriented. 	 communication tools to enhance verbal coordination. ✓ Discuss the results of SAT and SBT during daily multidisciplinary rounds. ✓ SAT and SBT should be included in nurse to nurse handoffs, nurse to charge nurse report, and charge nurse to charge nurse report (if they occur). ✓ Administer sedation using goal according to a scale such as a RASS or Modified Ramsey Score as ordered by MD.
Oral Care	 Perform regular oral care with an antiseptic solution, brush teeth, and perform oral and pharyngeal suctioning Educate the RN staff about the rationale supporting good oral hygiene and its potential benefit in reducing ventilator-associated pneumonia 	 Tooth brushing twice a day as part order sets for all ventilated patients. Include routine (every two to four hours) oral care with antiseptic mouthwash swab to clean oral cavity and teeth. Chlorhexidine 0.12% mouthwash at least daily (many studies site every 12 hours) as part of order sets for all ventilated patients. Create visual cues (e.g., empty holders of oral care products) indicating compliance with oral care. Include respiratory therapy in performing oral care; make it a joint RN and RT function.

¹ Richmond Agitation Sedation Scale (RASS)

² Munro CL, Grap MJ, Jones DI, McClish DK, Sessler CN. Chlorhexidine, tooth brushing and preventing ventilator-associated pneumonia in critically ill adults. Am J Crit Care. 2009; 18(5):428-437.

³ Garcia R, Jendresky L, Colbert L, Bailey A, Zaman M, Majumder M. Reducing ventilator-associated pneumonia through advanced oral-dental care: A 48-month study. Am K Crit Care. 2009; 18(6):523-532.

⁴ Chan EY, Ruest A, O'Meade M, Cook DJ. Oral decontamination for prevention of pneumonia in mechanically ventilated adults: Systematic review and meta-analysis. Brit Med J. 2007; 10:1136.



Prevention of Ventilator-Associated Pneumonia (VAP)

Mechanically ventilated patients are at high risk for complications. These risks include VAP, peptic ulcer disease (PUD), gastrointestinal bleeding, aspiration, venous thromboembolic events (VTE) and problems with secretion management. Evidence-based interventions can reduce the risk of these complications and reduce the occurrence of VAP. Implementing the ventilator bundle has shown to reduce VAP.¹ The VAP prevention bundle includes: head of bed elevated 30 to 45 degrees, oral care with chlorhexidine 0.12%, peptic ulcer prophylaxis, deep vein thrombosis prophylaxis, spontaneous waking trials and spontaneous breathing trials. This guide explores evidence-based practice for VAP reduction.

Suggested AIMs

Before the implementation work starts, the team must have a goal at which to aim. An AIM statement for VAP reduction efforts could include one of the following:

- Decrease the rate of VAP to a state median of 0.0/1,000 ventilator days (or state mean <1.0/1000 ventilator days) for at least 6 months by December 31, 2013
- Decrease the rate of VAP by 50% within 9 months and achieve a rate of 0.0/1,000 ventilator days by December 31, 2013
- Decrease the rate of VAP by implementing all elements of the ventilator bundle to more than 95% of ventilator patients in the ICU by December 31, 2013

Elevate Head of Bed raised between 30-45 degrees

Keeping the head of the bed between 30 to 45 degrees is a simple nursing measure that has been correlated in VAP reduction. Keeping the head of the bed (HOB) elevated has been demonstrated to help prevent aspiration of gastric contents and secretions^{2,3,4,5}.

• Process Measure: Daily audit of HOB elevation compliance and documentation of contraindications

Secondary Driver: Use visual cues

Visual cues are important to help remind staff to elevate the HOB. A visual cue can also act as a guide to show staff what 30 to 45 degrees actually is. Staff often underestimates the angle of the HOB. One study found that HOB angle was perceived correctly by 50 to 86% of clinicians.⁶

Change Ideas: Visual cues for HOB 30 to 45 degrees

Engage unit staff nurses to develop visual cues that work for their environment and work flow. Standardizing the process of care has shown to increase the number of patients who were placed in the semi recumbent position.⁷ Examples of visual cues:

- ✓ Use a line (red tape) on the wall that can only be seen if the bed is below a 30-degree angle.
- \checkmark Use a string hanging on the side of the bed to show the correct angle.
- ✓ Cut a piece of cardboard in the shape of a slice of pizza at the 30-degree angle.⁸
- \checkmark Place a red stripe on the bed's frame that is at 30-degree angle.
- ✓ Include the intervention on nursing flow sheets.
- ✓ Incorporate into HOB elevation into standardized order set.

Secondary Driver: Identify one person to check for visual cues

The environment of an intensive care unit is a busy and stressful one. Caregivers are confronted with multiple stimuli making demands for attention. Engagement of the entire team, bedside nurse, intensivists, nurse's aide, respiratory therapist, and charge nurse, is essential to ensure preventive measures are adhered to such as elevated HOB.



Change Ideas: Include HOB elevation in rounding

- ✓ Assign respiratory therapy staff or unit assistant to look for visual cues every one to two hours.
- ✓ If computerized, use a pop-up reminder that is computer based.
- ✓ Include the intervention on nursing flow sheets.
- ✓ Include HOB elevation in charge nurse rounds; charge nurse can provide just-in-time training, if charge nurses are utilized.
- Create an environment where respiratory therapists work collaboratively with nursing to maintain headof-the-bed elevation.
- ✓ If HOB elevation is contraindicated, document rationale.

Secondary Driver: Include cues/reminders on order sets

Previous research and experience suggests that standardized order sets can be effective in improving compliance to evidenced based practice such as ventilator bundles for VAP reduction, improved stroke care, sepsis, and more. Standardized order sets have been shown to increase patient safety and improve outcomes in multiple patient conditions.^{9,10,11,12}

Change Ideas: Utilize reminders

- ✓ If computerized, use a pop-up reminder that is computer based.
- ✓ Discuss during multidisciplinary rounds to ensure all bundle components have been implemented.
- ✓ Allow physicians to "opt-out" of the bundle or any particular element if contraindicated. Ask physician to help improve bundle by documenting rationale when it is not appropriate for the patient.

Secondary Driver: Educate patients and their families

Families can be made part of care. Education of families about the risks of VAP and how care givers mitigate that risk can help to make the family feel involved and connected. Families can also be asked to participate in that care by helping to keep the HOB 30 to 45 degrees. Families can do this by reminding staff to put the HOB up after such things as linen changes. Consumer groups are encouraging patients' families to be involved to help keep their loved ones safe.¹³

"Hardwiring" HOB elevation as part of improvement plan:

Many of the interventions are not only implementation strategies but also hardwiring strategies. Hardwiring for HOB includes routine reminders such as the following will help the intervention to become part of daily care:

- ✓ Include HOB elevation on daily audit checklist.
- ✓ Include the intervention on nursing and respiratory care flow sheets.
- ✓ Incorporate into HOB elevation into standardized order set.
- ✓ If computerized, use a pop-up reminder that is computer based.
- ✓ Include HOB elevation in charge nurse rounds. Charge nurse can provide just in time training, if charge nurses are utilized.
- ✓ Create an environment where respiratory therapists work collaboratively with nursing to maintain headof-the-bed elevation.

Peptic ulcer disease (PUD) prophylaxis

Critically ill patients requiring mechanical ventilation are at increased risk for stress ulcers and gastrointestinal bleeding from the stress ulcers. ¹⁴ Also, bacterial colonization of the stomach can lead to respiratory tract colonization and infection through aspiration of stomach secretions.¹⁵

• Process Measure: Daily audit of PUD prophylaxis compliance or documented contraindications

Secondary Driver: Use of Medications

To reduce PUD risk, mechanically ventilated patients should receive PUD prophylaxis.¹⁶



Change Ideas: H2 Blockers

- ✓ H2 blockers are preferred over sucralfate. Proton pump inhibitors may be efficacious and an alternative to sucralfate or H2 antagonist.¹⁷
- ✓ Discuss during multidisciplinary rounds.
- ✓ Include clinical pharmacist to guide complex cases.

Secondary Driver: Include PUD on the ICU order sets

Requiring PUD prophylaxis on both ICU admission and ventilator order sets will standardize the treatment. Allow physicians to "opt-out" when clinically appropriate and document reason for broad learning. You will need to determine how often a physician "opts out" if there are any patterns (certain types of patients, specific physicians) to determine if a change to the order set is required or another intervention is required.

Secondary Driver: Engage pharmacy (redundancy, failure remediation)

Asking pharmacy to support your program will add a layer of redundancy and ways to detect failure patterns earlier. They can produce reports from the pharmacy information system and consult with physicians as appropriate. A pharmacist as part of interdisciplinary rounds is beneficial to safety and cost-effective.

Change Ideas: Multidisciplinary approach

- ✓ Discuss during multidisciplinary rounds.
- ✓ Consider producing pharmacy exception report for PUD prophylaxis.
- ✓ Include a pharmacist on ICU multidisciplinary rounds.

Secondary Driver: Include PUD Rx on daily checklist

Change Ideas: Make it a part of daily rounds

✓ Include PUD in charge nurse rounds. Charge nurse can provide just in time training and assist bedside nurse in obtaining order for PUD, if charge nurses are utilized.

"Hardwiring" PUD Prophylaxis as part of improvement plan

To hardwire PUD prophylaxis, make the process of ordering PUD prophylactic mediation routine as possible. If contraindicated then the rationale should be documented. Methods for hardwiring stated above include:

- ✓ Include PUD in order sets.
- Include on daily audit checklist.
- ✓ Review need for PUD prophylaxis during multidisciplinary rounds.
- ✓ Include as a standing item in nurse to nurse handoff reports.

Venous Thromboembolism (VTE) prophylaxis

Mechanically ventilated patients are at high risk for VTE. Risk factors include stress inflammatory response resulting in hypercoagulation and immobility. Although there is no evidence to suggest VTE prophylaxis reduces VAP risk, it is appropriate to include in a bundle that supports care of the mechanically ventilated patient due to their high risk for VTE.¹⁸

• Process Measure: Daily audit of VTE prophylaxis compliance or documentation of contraindications

Secondary Driver: Initiate VTE prophylaxis unless contraindicated

All high risk patients should have pharmacological prophylaxis unless contraindicated due to bleeding risk. For patients with severe bleeding risk, mechanical prophylaxis is recommended unless contraindicated due to patient condition. Intermittent pneumatic compression (IPC) is preferred for mechanical prophylaxis.¹⁹ The addition to pharmacological prophylaxis has shown some benefit in VTE reduction.²⁰



Change Ideas: Standardize with ICU Order Sets

- ✓ Include VTE prophylaxis as part of your ICU order admission set and ventilator order set.
- ✓ Allow physicians to "opt out" for appropriate patients and document the reason for learning purposes.

Secondary Driver: Interdisciplinary support

Engage pharmacists to ensure ICU patients have some form of VTE prophylaxis (redundancy, failure remediation); review on interdisciplinary rounds.

Change Ideas: Team approach

- ✓ Include VTE in ICU rounds. Nurse leaders can provide just-in-time training and assist bedside nurse in obtaining order for VTE prophylaxis, if charge nurses are utilized.
- ✓ Consider creation of a pharmacy exception report to determine if appropriate VTE prophylaxis is provided.

Secondary Driver: Include VTE Rx on daily checklist

"Hardwiring" VTE Prophylaxis as part of improvement plan

Hardwiring VTE prophylaxis strategies are similar to PUD prophylaxis. Making the process as routine as possible will help to ensure that VTE prevention is addressed in every mechanically ventilated patient.

- ✓ Include VTE prophylaxis as part of your ICU order admission set and ventilator order set.
- ✓ Include on daily audit checklist.
- ✓ Include in multidisciplinary rounds.
- ✓ Utilize pharmacy to review all patients or produce exception reports to ensure adequate and appropriate prophylaxis.
- ✓ Include as a standing item in nurse-to-nurse handoff reports.

Spontaneous Awakening Trials (SAT, or sedation vacation)/ Spontaneous Breathing Trials (SBT)

Sedation in the mechanically ventilated patient may be necessary to control anxiety, help in pain management and control oxygenation demands. However, use of sedation does have disadvantages such as prolonging the duration of mechanical ventilation. It is vital that patients receiving sedation have a neurological assessment daily. Each day the patient's sedation is withheld until the patient is able to follow commands or he/she becomes agitated. Daily screening of respiratory function using trials of spontaneous breathing with daily awakening trials has been shown to reduce the duration of mechanical ventilation and risk of VAP.^{21,22,23}

• Process Measure: Daily audit of SBT/SAT compliance or documentation of contraindications

Secondary Driver: Spontaneous Awakening Trials (SAT) and a Spontaneous Breathing Trial (SBT) Protocols

The use of non-physician staff driven protocols have been found to be very effective in assessing readiness to wean. By developing staff driven protocols and incorporating SAT and SBT into daily care of the ventilator patient, patients will experience fewer days on the ventilator and a shorter ICU stay.^{24,25} Staff driven protocols have also demonstrated a reduction in VAP.²⁶

Change Ideas: Assess Daily for Readiness and Success with SAT/SBT

- ✓ Determine if patient meets SAT criteria (no contraindications).
- ✓ Decrease or stop sedation per SAT protocol (usually nursing).
- ✓ Determine if patient meets SBT criteria (no contraindications).
- ✓ Perform an SBT per protocol (usually respiratory therapy).
- ✓ Perform daily assessments of readiness to wean and extubate based on the SAT/SBT results.



Secondary Driver: Coordinate SAT and SBT to maximize weaning opportunities when patient sedation is minimal

Nursing and respiratory therapy must work as a team to ensure patient safety and that all VAP prevention bundle interventions are addressed. SBTs will fail if the patient has too much sedation to allow for the "spontaneous" portion of the trial.

Change Ideas: Coordinate and communicate

- ✓ Provide a daily reduction or removal of sedative support.
- ✓ Consider one time of day that the SAT and SBT are attempted.
- ✓ Determine how often SBTs fail due to high levels of sedation.
- ✓ Coordinate between nursing and respiratory therapy on managing SAT and SBT. Use white boards, EMR or other communication tools to enhance verbal coordination.
- ✓ Discuss the results of SAT and SBT during daily multidisciplinary rounds.
- ✓ SAT and SBT should be included in nurse-to-nurse handoffs, nurse to charge nurse report, and charge nurse to charge nurse report.

Secondary Driver: Sedation should be goal oriented

Sedation is often needed to assist in the pulmonary recovery of patient. Too little sedation can lead to increased anxiety, increased work of breathing, drop in blood and tissue oxygenation and self extubation. Too much sedation can lead to decreased respiratory muscle function, prolonged neurological depression and the inability to wean from mechanical ventilation. The use of a sedation algorithm or scale, such as the RASS, that all caregivers use to monitor the level of sedation will help to reduce over sedation, help to deliver the most effective dose, and reduce mechanical ventilation time.^{27,28}

Change Ideas: Implement a sedation protocol

- ✓ Administer sedation using goal according to a scale such as a RASS, SAS or Modified Ramsey Score as ordered by MD. These scores also help standardize communication and actually take less time than varying qualitative descriptions of level of sedation.
- ✓ Assess at least daily if the target RASS/Modified Ramsey/SAS goal is met or reasons why it is not.
- Implement ABCDE bundle. "The ABDCDE bundle includes spontaneous awakening and breathing trial coordination, careful sedation choice, delirium monitoring, and early progressive mobility and exercise. The intent of combining and coordinating these individual strategies is to (1) improve collaboration among clinical team members, (2) standardize care processes, and (3) break the cycle of over sedation and prolonged ventilation, which appear causative to delirium and weakness." ^{29, 30}
 - A & B = awakening and breathing trial coordination
 - C = Choice of sedative
 - D = Delirium detection
 - \circ E = Early progressive mobility and exercise ^{31,32}

"Hardwiring" SBT & SAT as part of improvement plan

To hardwire SBT/SAT, incorporate intervention in daily work flow. Examples of hardwiring include:

- ✓ Implement non-physician staff driven protocols for daily SBT/SAT.
- ✓ Include SBT & SAT protocol on order sets.
- ✓ Include in daily audit checklist.
- ✓ Include on nursing and respiratory care flow sheets.
- ✓ Include as a standing item in nurse-to-nurse handoff reports.
- ✓ Anticipate fears about self-extubation and manage implementation in smaller steps. The literature suggests self-extubation is slightly higher but re-intubation is not, indicating that many if not most patients were ready for extubation.



Oral Care

Oral care can seem like a simple thing but often the 'simple' things are the hardest to implement. A nurse swabbing a patient's mouth with an antiseptic mouthwash has been, until recently, associated mostly with comfort. Recent studies have demonstrated that oral care with an antiseptic has reduced the risk for VAP.

• Process Measure: Daily audit of oral care compliance

Secondary Driver: Perform regular oral care with an antiseptic solution, brush teeth, and perform oral and pharyngeal suctioning

It is a simple thing that can have a large impact in protecting a patient from VAP.³³

Change Ideas: Routine Oral Care Standardized

- ✓ Teeth brushing twice a day as part of order sets for all ventilated patients.^{34,35}
- ✓ Include routine (every two-four hours) oral care with antiseptic mouthwash swab to clean oral cavity and teeth.³⁶
- Chlorhexidine 0.12% mouthwash at least daily (many studies site every 12 hours) as part of order sets for all ventilated patients.^{37,38,39}
- Create visual cues (e.g., empty holders of oral care products; dating and timing products) indicating compliance with oral care.
- ✓ Include respiratory therapy in performing oral care; make it a joint RN and RT function.
- ✓ Use white board to document delivery of oral care thus making failure `obvious.'

Secondary Driver: Educate the RN staff about the rationale supporting good oral hygiene and its potential benefit in reducing ventilator-associated pneumonia

Institution of the ventilator bundle alone does not always result in a decrease in VAP. A decrease in VAP is more likely to occur when compliance with the "bundle" is audited and feedback is given to the staff on a routine basis.^{40,41}

"Hardwiring" Oral Care as part of improvement plan

Like the earlier interventions, hardwiring oral care is multifocal.

- ✓ Include oral care in order sets.
- ✓ Include on nursing care flow sheets.
- ✓ Make it obvious that oral care has been provided.
- ✓ Involve family if appropriate.

Potential Barriers:

- Clinicians may believe, strongly so, that they already perform these activities, especially if the VAP rate is low. Monitor for bundle compliance to test the reliability of each of the primary drivers in practice. For example, check five ventilated patients to determine bundle compliance on each element. Was the sedative really turned off and for how long? Was it restarted at the same dose or was it lowered if possible. If IPC was used for VTE prophylaxis, was it actually functioning? Is there documentation of medications for PUD and VTE prophylaxis if appropriate?
- Recognize that for many physicians this will change their practice.
 - Traditionally, weaning and sedation was a function of the physician, not an interdependent function with non-physician staff. Include lead physicians in the improvement team. Select these leads to work as champions to dialogue with physician colleagues.
 - Order sets and protocols seen by some physicians as "cookbook" medicine. It is actually "best recipe" medicine that uses what is known in the literature to provide the best opportunity for each patient based on their individual needs to receive the care that will reduce their risk for VAP.
 - o Clinicians may see tasks as "ours" and "theirs," such as: oral care is perceived as a nursing task,



medications are the responsibility of the physician or ventilators are the responsibility of the respiratory therapist. Including key stake holders such as bedside nurses, physicians, and respiratory therapists in the improvement team to develop protocols, work flows, conduct peer to peer education has been shown to be effective in successfully implementing best practices.^{42,43}

 These processes may be new territory for many physicians, nurses, respiratory therapists, and pharmacists. Nurses and respiratory therapists may be concerned that they may make a mistake, that patients may self extubate during a SBT/SAT trial, or that the medical staff will not be receptive and may become angry. Education of all parties, both about the risk of VAP and proven methodologies to reduce VAP, and evidence from like hospitals demonstrating successful implementation without the dangers of self extubation or other preconceived complications will help mitigate this.

Using administrative leadership sponsorship to help remove or mitigate barriers

- It is important to start with the one early adopter physician who can help lead and then recruit early adopter champions from specialties and intensivists.
- A management executive sponsor, recognizing the value to the patients and the value to the organization of preventing VAP, can help brainstorm solutions to what may appear to be added work, or provide resources to mitigate that additional work. An executive sponsor can also help to see the "big picture" on how this may impact organization-wide, and champion through requests for workflow change or supplies. Executive sponsors can help educate, lead, and provide solutions to staffing barriers.
- A senior or "opinion leader" physician is crucial to accomplish the goal of organization-wide adoption of best practices order sets. The unit that you decide to first trial this change should be in an area where the initiative is supported by a respected physician leader.

Not just a change in practice but a change in culture

- Instituting the VAP bundle well require a change in culture, particularly physician culture. The physicians will be asked to trade their traditional way of individualizing mechanical ventilation management for each patient for a more standardized and effective approach. This may appear to be both a loss of control as well as irresponsible to give up that control. Yet, physicians remain key components on monitoring the effectiveness of therapy and the overall condition of the patient.
- Nurses and respiratory therapists will also experience change in that this may be the first time they would have to collaborate to such a degree. Many may be uncomfortable with the notion of staff driven protocol independent of the physicians. Education and involvement of staff in the development of the protocols may help to mitigate.
- Order sets feel like a loss of autonomy to clinicians who are not used to them. For some, this will be a change in how they work. Take advantage that many physicians learn from peers. Most physicians will follow their peers before they will follow "expert advice."
- This is an example of an innovation that will require small tests of changes and planned spread driven by success. The ideal end result is the development of team based care where each member of the team (physician, nurse, respiratory therapist) contributes to better and safer patient care.

Tips on How to Use the Model for Improvement

- Implementing the VAP Bundle take it an element at a time.
 - When deciding what of the bundle to first implement, choose a bundle element that would be easy to try and will have a great impact. For example, implementing HOB elevation is less complicated and has a big impact on VAP risk reduction compared to implementing a complicated SBT/SAT protocol.



- Testing SBT/SAT protocols
 - o Step One: Plan
 - Do not reinvent the wheel when developing SBT/SAT/Delirium protocol. Use another hospital's protocol that has been successful and adapt it to your facility.
 - Take it one step at a time. Do not plan to implement all of the ABCDE recommendations. Concentrate first on the ABC and then add the D and E.
 - Step Two: Do
 - Ask one or two of the physicians on the committee to trial this with their next ventilated patients. This should be someone who wants to work with you.
 - Ask one or two nurses and a respiratory therapist to trial the protocol on the committee that is comfortable.
 - Test small: Coordinate with the physician to use the protocol on one patient, with one nurse, and one respiratory therapist.
 - o Step Three: Study
 - Evaluate immediately after the test with those involved in the test to record what did happen, what went well, what did not go well, and what should we change for next time? Make the posttest huddles short and action oriented.
 - Step Four: Act
 - Do not wait for the next committee meeting to make the changes.
 - Next test use the same physician, same nurse, same respiratory therapist.





U lcer prophylaxis **P** ain control



APPENDIX II: ABDCE Protocol Example from ICU delirium.org

Bedside Treatments for ABCDE Protocol www.icudelirium.org Rwakening and Breathing Coordination

ABC

eligibility for ABC = on the ventilator

SRt Sarety Screen: No active seizures, no active alcohol withdrawal, no active agitation, no active paralytics, no active myocardial ischemia, no evidence of ↑ intracranial pressure

If passed the safety screen, Perform SAt

(Stop all sedatives/analgesics used for sedation)

IF FAIL \rightarrow restart sedatives if necessary at ½ dose and titrate as needed

Ir rass → Perform SBT safety screen

SBt Sarety Screen: No active agitation, oxygen saturation > 88%, FiO₂ < 50%, PEEP < 7.5 cm H₂O, no active myocardial ischemia, no significant vasopressor use, displays any inspiratory efforts

If passed the safety screen, Perform SBt

SBT is discontinuation of active ventilator support through a T-tube or ventilator with a rate set as 0, CPAP/PEEP \leq 5 cmH₂O, and pressure support of \leq 5 cmH₂O.

IF Fall → Return to ventilator support at previous settings

IF rass \rightarrow Team should consider extubation

D

Delirium Nonpharmacologic Interventions

eligibility for D = RASS > -3 (any movement or eve opening to voice)

Pam: Monitor and/or manage pain using an objective scale

Orientation: Talk about day, date, place; discuss current events; update white boards with caregiver names; use clock and calendar in room

Sensory: Determine need for hearing aids and/or eye glasses

SLEEP: Provide & encourage sleep preservation techniques like noise reduction, day-night variation, "time-out" to minimize interruptions of sleep, promoting comfort & relaxation

e

early exercise and Mobility

eligibility for e = All MIND-USA study patients

EXERCISE SAFETY SCREEN: RASS > -3, FiO₂ <0.6, PEEP <10 cm H₂O, no increase in vasopressor dose (2 hrs.), no active myocardial ischemia (24 hrs.), and no arrhythmia requiring the administration of a new antiarrhythmic agent (24 hrs) **Levels of Exerary** (if passes safety screen):

1. Active range of motion exercises in bed and sitting position in bed

2. Dangling

3. Transfer to chair (active), includes standing without marching in place

4. Ambulation (marching in place, walking in room/hall)

txese activities will be actively monitored as part of the MIND-USA study with the goal for bedside staff to perform with study patients by 2 pm daily.



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Implementation Guide to Prevention of Venous Thromboembolism (VTE)

HRET Contact <u>hen@aha.org</u> (312) 834-7056 www.hret-hen.org



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Prevention of Venous Thromboembolism (VTE) Overview

Background:

- Pulmonary Embolus resulting from Deep Venous Thrombosis is the most common cause of preventable hospital death.
- A U.S. multi-center registry study showed the majority of hospitalized patients with risk factors for DVT did not receive prophylaxis.
- The risk for developing VTE varies between 10 85% (depending on reason for admission).
- The rate of fatal pulmonary embolus more than doubles between the ages of 50 and 80.

Suggested AIM:

- Reduce the incidence of hospital-acquired VTE by 30% by December 31, 2013
- Increase the utilization of appropriate VTE prophylaxis in at-risk patients to 100% by December 31, 2013

Potential Measures:

Outcome: Incidence of hospital-acquired VTE (number of VTE per 100 admissions); goal: reduce by 50% in one year. Incidence of hospital-acquired VTE resulting in fatality (number of deaths due to acquired VTE per 100 admissions).

Process: Percent of patients screened on admission using VTE risk assessment tool Compliance with appropriate VTE prophylaxis (percent of patients who should have received prophylaxis, whether screened or not, who actually received appropriate prophylaxis).

Note: "Hospital-acquired" includes the 30-day period post discharge

Primary Drivers	Secondary Drivers
Effective risk	✓ Adopt a VTE risk-assessment screening tool; simplify as much as possible.
assessment	✓ Assess every patient upon admission of his/her risk for VTE using the VTE risk assessment screening
	tool.
Develop best practices	✓ Review key resources and identify best practices.
for prophylaxis	✓ Adopt a standardized risk-stratified menu of choices for prophylaxis; simplify as much as possible.
Standardize care	 Develop standard written order sets which link the risk assessment to the choice of prophylaxis.
processes	 Identify contraindications and include them in order sets.
	✓ Allow for 'opt-out' as clinically indicated.
Decision support	✓ Use protocols for dosing and monitoring.
Involve the patient and	 Alert patients and families to early signs and symptoms of VTE.
family	 Give clearly written and well explained VTE discharge instructions to patients and families.
	 Use 'read back' to demonstrate that patients and families have thorough understanding of dosing,
	physician and lab follow-up appointments.

Making Changes:

This intervention is in the Collaborative with Reducing Pressure Ulcers and Falls (PIVOT Collaborative). National meetings, webinars, monthly coaching calls, change packages and other tools will augment state hospital association activities. The Collaborative will leverage the IHI Model for Improvement (Plan-Do-Study-Act).

Key Resources:

- Executive Summary: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines *Chest February 2012 141:2_suppl 7S-47S*
- Qaseem et al, Venous Thromboembolism Prophylaxis in Hospitalized Patients: A Clinical Practice Guideline From the American College of Physicians Annals Internal Medicine 1 November 2011 155 (9):625-633
- American College of Chest Physicians (ACCP). Prevention of venous thromboembolism. American College of Chest Physicians evidence-based clinical practice guidelines (8th edition). Chest 2008 Jun;133(6 Suppl):381S-453S. [728 references]
- American Academy of Orthopaedic Surgeons (AAOS). American Academy of Orthopaedic Surgeons clinical guideline on prevention
 of symptomatic pulmonary embolism in patients undergoing total hip or knee arthroplasty. Rosemont (IL): American Academy of
 Orthopaedic Surgeons (AAOS); 2007. 63 p. [49 references]
- Society of Hospital Medicine VTE Resource Guide: <u>http://www.hospitalmedicine.org/ResourceRoomRedesign/RR_VTE/VTE_Home.cfm</u>
- AHRQ Prevention of VTE Following Hip and Knee Reconstruction Synthesis of Guidelines : <u>http://www.guideline.gov/syntheses/synthesis.aspx?id=16473</u>





Prevention of Venous Thromboembolism (VTE) Driver Diagrams

2012-2013



AIM: Reduce the Incidence of Hospital Acquired*Venous Thromboembolic Events by 30% by 12/31/13 *Includes events occurring within 30 days of discharge

Primary Drivers	Secondary Drivers	Change Ideas
Effective Risk Stratification	 Adopt effective and reliable risk assessment screening risk for VTE and bleeding ^{1,2,3,4} Develop mechanisms to ensure risk screening for all admitted patients 	 Simplify to low, medium and high-risk levels that dictate different treatment options ^{1,2,3,4} Screen on admission and upon transfer to new level of care or condition change
Standardized Care Process	 Create a system for regular updates from the medical literature Develop, adopt, and apply best practices to all patients Develop standard order sets and protocols Allow "opt-out" methodology where clinically appropriate Develop ambulation protocols 	 See key resources as starting point ^{5,6,7,8,} Develop standardized order sets with risk linked to appropriate prophylaxis. Analyze use of order sets as overall process learning tool Create a nurse/physical therapy directed progressive mobility protocol⁹
Decision Support	 Monitor timeliness of administration practices Use flow sheets that follow the patient through the transitions of care Have pharmacist round concurrently with physicians Use pharmacists to assist with identification of alternatives when contraindications exist 	 Understand the current state: use sampling strategies to perform real time audits in various units whether on paper or EMR Use validated tools to assess current knowledge of clinical staff regarding risk of anticoagulants ^{10,11} Pilot pharmacist participation on rounds in ICU or post-op orthopedics unit Have pharmacists available to all clinical staff by immediate electronic device/method
Prevention of Failure	 Have pharmacists perform independent double checks of all VTE prophylaxis orders 	 a on paper, have nursing fax an risk assessment and documentation of contraindications to pharmacy with VTE prophylaxis orders



Implementation Guide to Prevention of Venous Thromboembolism (VTE) 6

Primary Drivers	Secondary Drivers	Change Ideas
Identification and Mitigation of Failure	 Minimize or eliminate nurse distraction during medication administration process Standardize concentrations and minimize dosing options where feasible 	 Change Ideas If electronic, then risk assessment must be visible to pharmacist Communication of risk and prophylaxis to the entire health care team including consulting physicians and nursing, e.g. place on nursing kardex to include VTE risk and prophylaxis. If electronic, create hard stop for admitting and transferring physician to address risk and prophylaxis. Perform independent double checks Use the "cone of silence" during medication administration Use visual cues like HAM specific flags at bedside INSULIN: Allow patient management of insulin where
	 Timely lab results with effective system to ensure review and action Use non-pharmacological methods of pain and anxiety management where appropriate Identify "look-alike, sound-alike" medications and create a mechanism to reduce errors (e.g., different locations, labels, alternate packaging) 	 appropriate INSULIN: Set limits on high dose orders ANTICOAGULANTS: Use prepackaged heparin infusions; reduce the number of heparin concentrations in the hospital ANTICOAGULANTS: Use low molecular weight heparin instead of unfractionated heparin whenever clinically appropriate ANTICOAGULANTS: Make lab results available within two hours ANTICOAGULANTS: Perform automatic nutrition consults for all patients on warfarin to avoid drug-food interactions NARCOTICS/SEDATIVES: Use a table of drug to drug conversion doses NARCOTICS/SEDATIVES: Use fall prevention programs NARCOTICS/SEDATIVES: Use dosing limits
Smart Use of Technology	 Educate patients/families regarding risk of ADEs from 'their' HAMs Administer medications on time Analyze dispensing unit override patterns Transition to "just culture" environment for improved error analysis Prompt real time learning from each failure 	 Monitor, understand, and mitigate medication administration delays Assess culture with Agency for Healthcare Research and Quality Culture of Safety survey ¹¹ Use error reporting system to allow aggregate learning to redesign error prone processes Use technology to alert (real time) key staff when rescue drug administered

Footnotes:

- ¹ Rogers et al, J Am Coll Surg 2007;204:1211–1221 (see page 1219 for risk scoring tool)
- ² Caprini, Joseph, VTE Risk Facto Assessment Tool <u>http://www.crmhealthcare.net/docs/67450a_CapriniRiskAssesemntTool.pdf</u>
- ³ Geerts, WH et al, CHEST June 2008 vol. 133 no. 6 suppl 381S-453S <u>http://chestjournal.chestpubs.org/content/133/6_suppl/381S.full</u>
- ⁴ Geerts, WH, Texas SCIP Webex, 28 March, 2007 (pdf)

⁵ Guyatt et al, Executive Summary: Antithrombotic Therapy and Prevention of Thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines *Chest February 2012 141:2 suppl 7S-47S*

⁶ American Academy of Orthopaedic Surgeons (AAOS). American Academy of Orthopaedic Surgeons clinical guideline on prevention of symptomatic pulmonary embolism in patients undergoing total hip or knee arthroplasty. Rosemont (IL): American Academy of Orthopaedic Surgeons (AAOS); 2007. 63 p. [49 references]

⁷Society of Hospital Medicine VTE Resource Guide

⁸AHRQ Prevention of VTE Following Hip and Knee Reconstruction Synthesis of Guidelines

⁹ Timmerman, Rosemary, A Mobility Protocol for Critically III Adults, Dimensions of Critical Care Nursing Vol. 26 / No. 5, September/October 2007: 175-179 <u>http://www0.sun.ac.za/Physiotherapy_ICU_algorithm/Documentation/Rehabilitation/References/Timmerman_2007.pdf</u>

¹⁰ Hsaio et al, Nurses' knowledge of high-alert medications: instrument development and validation, Journal of Advanced Nursing 66(1), 177-190

¹¹ Lu, M.-C.et al, Nurses' knowledge of high-alert medications, A randomized controlled trial, Nurse Educ. Today (2011)



Prevention of Venous Thromboembolism (VTE)

VTE includes pulmonary embolism (PE) and deep vein thrombosis (DVT). VTE is the most common preventable cause of hospital death.^{1,2,3}

Fortunately, pharmacologic and mechanical methods to prevent VTE are safe, cost-effective and advocated by authoritative guidelines.⁴ Yet, despite the reality that hospitalized medical and surgical patients routinely have multiple risk factors for VTE, making the risk for VTE nearly universal among inpatients, large prospective studies continue to demonstrate that these preventive methods are significantly underutilized.^{5,6,7,8,9,10}

The Agency for Healthcare Research and Quality calls thromboprophylaxis against VTE the "number one" patient safety practice. The American Public Health Association has stated that the "disconnect between evidence and execution as it relates to DVT prevention amounts to a public health crisis."¹¹

The following statements reflect best practice statements from the American College of Chest Physicians (ACCP) and the American Academy of Orthopaedic Surgeons (AAOS).

- In medical patients, low-molecular-weight heparins (LMWH), enoxaparin and dalteparin have efficacy comparable to subcutaneous heparin three times daily (SQ Heparin), but offers lower complication rates and other advantages potentially important to patients and nursing. ^{12,13,14,15}
- In certain higher risk patient groups (e.g. hip and knee replacement, trauma, and spinal cord injury) LMWH, *in some studies*, has demonstrated superiority over SQ heparin and fondiparinux.^{4,16,17,18,19,20}
- Controversy exists with regard to the hip and knee replacement patients. The ACCP prefers LMWH ¹⁶ while the AAOS states that there is not enough evidence to recommend one form of pharmacologic prophylaxis over another. ²¹
- In certain patient groups, extending prophylaxis with LMWH to approximately four to five weeks may be more effective than one week (e.g. hip replacement, surgery for cancer, and possibly medical patients with reduced mobility). The AAOS states that there is not enough evidence and that such extension should be individualized.
- In certain patient groups, the adequacy of twice daily SQ heparin has not been proven.⁴
- In very high-risk patient groups, the addition of mechanical prophylaxis to a pharmacologic regimen may offer added benefit. The AAOS recommends this combination therapy in hip or knee replacement patients who have a history of prior VTE. ^{4, 21}
- Certain patient groups should not receive certain pharmacologic agents or doses, or receive smaller doses of LMWH (e.g. creatinine clearance < 30 cc/minute) i.e. elderly, impaired renal and/or hepatic function.⁴
- Certain patient groups should receive pharmacologic doses in close coordination and timing with other events (e.g. surgery).

The clear messages from the literature are that:

- 1. VTE is common among both medical and surgical hospitalized patients. ¹⁰
- 2. Fifty percent or more of VTE are preventable. ¹⁰
- 3. Ten percent of VTE events can result in fatal pulmonary embolus, the most common preventable cause of hospital death.¹⁰
- 4. Complex assessment models are logistically difficult to incorporate into workflows and typically associated with suboptimal compliance.^{4,10,16}
- 5. Complex assessment models do not confidently identify patients who do not require prophylaxis or predict how risk factors combine to position an individual patient along the spectrum of VTE risk. ^{4,10,16}



Therefore simple risk assessment models that stratify all patients into three to four easy to understand groups are favored over more complicated point scoring systems.¹⁰

Suggested AIMs

- Reduce the incidence of hospital-acquired VTE by 30% by 12/31/2013
- Increase the utilization of appropriate VTE prophylaxis in at-risk patients to 100% by 12/31/2013

Effective Risk Stratification

Effective risk stratification allows for the development of standardized processes that can drive more effective prophylaxis. Employing the simplest risk stratification makes this process easier to accomplish and more likely to be reliably applied. Although simple, this approach does not reduce the effectiveness of the therapeutic alternatives for patients.

Secondary Driver: Adopt a risk-assessment screening system

Adopt a risk-assessment screening tool that is easy to complete and embed it into the workflow. More complex tools create extra work, creating reliability and sustainability problems, with limited changes to the therapeutic approach.

Secondary Driver: Risk screen all admitted patients.

Develop a VTE risk-screening tool and determine when and by whom it will be completed.

Secondary Driver: Repeat risk screening for patients on change of condition.

Repeating risk-screening for VTE prophylaxis or the appropriateness of therapy is important as a patient's condition changes. For example, a patient may have had contraindications for anti-coagulation because of a surgery or injury. As he/she have recovered and moves to a lower level of care anticoagulant therapy may have become indicated rather than contraindicated. Conversely a patient status could worsen such that different levels of thromboprophylaxis are now indicated. An example would be adding mechanical or anticoagulant prophylaxis to create combination therapy in a complicated post-operative surgery patient.

Change Ideas:

- Screen on admission and upon transfer to new level of care or condition change.
- Link risk screen to another process such as medication reconciliation.
- Select a tool that segments patients and provides for associated treatment options²³

Suggested Process Measures

- The percent of patients who receive screening upon admission
- The percent of patients who receive screening upon transfer
- The percent of patients who develop VTE and are not on prophylaxis

"Hardwiring" Effective Risk Stratification as part of improvement plan:

As suggested above, tie the screening to a trigger; the trigger could be admission orders (physician, nurse or pharmacist), the transfer orders, or medication reconciliation at each step. Create a "soft stop" in an electronic medical record, or by policy with paper records to add independent reassessment by the pharmacist of any patient screened as low risk (any patient admitted who does not receive VTE prophylaxis orders within a specific period of time). This will counter the tendency based on past practice to underestimate the risk of VTE in hospitalized patients. Finally, determining who performs the risk-stratification and how the is communicated to the entire team promotes sustainability.



Standardized Care Processes

Standardized processes provide for more reliable care. They ensure that every patient gets evaluated and treated using standard tools. The use of these tools is linked to triggers, such as admission, or transfer, or time of operative intervention.

Secondary Drivers: Create a system for regular updates from the medical literature.

Use the pharmacy & therapeutics committee or other designated committee of the medical staff to oversee periodic review of medical literature and protocols that contain medications.

Secondary Driver: Develop standard VTE order sets and protocols.

"Standard work" assures that by default the patient gets the agreed upon standard of care, *unless the patient is known to have a condition that would dictate alternate care*. Order sets are one regimen to produce standard work but only offer a limited set of choices that may need adaptations for patients with special circumstances. Order sets improve standardization by reducing the need to remember all aspects of care.

Secondary Driver: Allow "opt out" methodology where clinically appropriate.

Reliability theory has demonstrated that an "opt-out" approach, where a physician must specifically remove a portion of the order set and usually identify a reason why, can, in certain circumstances, lead to better outcomes. Analysis of these "opt out" orders where utilized and the reason given can lead to one of several improvements: 1) it can show where there are opportunities to improve the standard process; 2) it can lead to opportunities to educate the clinicians as to best practices, and 3) it can make it apparent that certain uncommon or complex conditions are more suitable for clinician care that is not driven by standard work.

Secondary Driver: Develop ambulation protocols

Reduced mobility is a risk factor for the development of VTE. Putting a process into place that assesses a patient's mobility and generates a recommendation for physical therapy referral will enable staff to safety mobilize patients. Nurse driven mobility protocols have demonstrated to be effective in reducing immobility related complications and reducing length of stay.^{23 24}

Change Ideas:

- Start with the key literature references that summarize current best practices. ^{10,16,25,26}
- Use the ISMP newsletters and national references to stay abreast of the literature; assign specific staff the responsibility.
- Develop standardized order sets. See Appendix I for an example. Risk should be linked to appropriate prophylaxis in the order set.
- List most common reasons for 'opt-out' on order sheet for easy documentation and analysis.
- As spread is occurring, analyze the opt-out reasons on a regular basis to help improve the order set or educate the late adopters.
- Create a nurse/physical therapy directed progressive mobility protocol.²⁷

Suggested Process Measures

- The percent of patients who are moderate or high risk based and have VTE prophylaxis ordered
- The percent of patients who receive the correct form of VTE prophylaxis

"Hardwiring" Standardized Care Processes as part of improvement plan:

If your orders are on paper, create one form on a single page that serves as both a risk assessment form and a prophylaxis order form. The risk assessment should drive the prophylaxis order. If electronic, design the system so the risk assessment drives the appropriate prophylaxis. The order form should also list the most common reasons for alternate therapy. This allows the physician to document his or her thinking on the order form. It also allows for simplified data aggregation that promotes rapid learning.



Decision Support

"Active" decision support has been shown to improve clinical practices and patient care. Decision support is often divided into active versus passive.

"Active" decision support occurs when a prompt is given to the caregiver suggesting the best practice based on other knowledge in the system about the patient. This can be in paper form, as discussed above, with a risk stratification tool linked to an order set on the same one-page paper. An essential part of an electronic medical record (EMR) is the use of logic to assess the patient's individual clinical information that is present in the system, and based on provider approved best practices, notify clinicians of the recommended care path in real time. These are usually recommendations only, as the logic in the system cannot possibly represent all possible combinations of patient factors. In the case of VTE this would represent the order set automatically being prompted based on the risk assessment that had been entered in the system.

"Passive" decision support occurs when clinicians are offered resources that they can query when they choose to regard a specific patient condition or medication. Because this is voluntarily and not "in your face" it has not been shown to effectively change clinician practices enough to improve overall patient safety.

Secondary Drivers: Use flow sheets that follow the patient through the transitions of care.

Medication administration flow sheets for anticoagulants should follow the patient from unit to unit and not be owned or kept by that unit once the patient is transferred. The lack of information continuity during the handoff can lead to errors during transition of care.

Secondary Driver: Have a pharmacist available on units as part of care team.

Experience has shown that when clinical pharmacists are available on the units and round as part of the care team, the team is more likely to utilize the pharmacist's knowledge and experience, improving the decision-making and reducing errors. To optimize the resource outlay of clinical pharmacists, target areas in the hospital where medication intensity is high and errors are more common.

Secondary Driver: Use pharmacists to identify alternatives when contraindications exist.

When a patient has a contraindication to standard therapy, the decision-making can become quite complex. Consulting a clinical pharmacist can improve the ultimate decision-making regarding prophylaxis and potentially dosing.

Change Ideas:

- Understand the current state: use sampling strategies to perform real time audits in various units whether on paper or EMR.
- Use validated tools to assess current knowledge of clinical staff regarding risk of anticoagulants.^{28,29}
- Pilot pharmacist participation on rounds in ICU or post-op orthopedics unit.
- Have pharmacists available to all clinical staff by immediate electronic device/method.

Suggested Process Measures

- The number of consultation requests that the clinical pharmacist receives
- The number of prophylactic anticoagulant orders that were modified as a result of pharmacist consultation

"Hardwiring" decision support as part of improvement plan:

Try adding the pharmacist phone or pager in an obvious place in the "opt-out" section of the order set.

Prevention of Failure

According to reliability theory principles, processes to prevent failure, supported by processes to identify and mitigate failure early, provide the best opportunities to provide reliable, effective and safe care. The following are some strategies and change ideas that have worked for some organizations.



Secondary Driver: Independent double checks of all VTE prophylaxis orders

Independent double checks occur when one clinician double checks the work of another. It recognizes "human factors"; we are not perfect and as humans we make mistakes. Assuming that clinicians never make mistakes leads to predictable error. Use of the pharmacist to review VTE prophylaxis orders help ensure that order errors (drug, dose, frequency, and route) do not occur.

Change Ideas:

- If on paper, have nursing fax all risk assessment and documentation of contraindications to pharmacy with VTE prophylaxis orders; if electronic, then the risk assessment must be visible to pharmacist along with the medication orders.
- The above processes allow the pharmacist to double check the appropriateness of the order based on medical staff policy and correctness and completeness of the order.
- Communicate each patient's VTE risk and prophylaxis to the entire health care team including consulting physicians, nurses, physical therapists (e.g. place where all members of the healthcare team have access).
- Create process "stops" at admission and transfer that requires the appropriate clinician to acknowledge and address VTE risk and prophylaxis.

Suggested Process Measures

- The percent of "opt-out" orders that are sent to the pharmacist
- The percent of patients with VTE prophylaxis orders that are changed at transfer to a different level of care
- The percent of moderate or high risk patients without VTE prophylaxis orders

"Hardwiring" prevention of failure as part of improvement plan:

Create process "stops" in workflows that require pharmacy review of orders and clinician review and re-review of risk and prophylaxis orders upon admission and transfer to a different level of care.

Identification and Mitigation of Failure

It is very difficult to design a system that prevents failure at all times. Early identification and mitigation of failure when it does occur is a central part of reliable processes.

Secondary Driver: Educate patients and families

Education of the patients and families regarding the risk of VTE, bleeding and other complications can both help prevent as well as mitigate failures when they occur. The patient or family member may be the first to become aware of the signs of a complication of anti-coagulation, the side effects of mechanical prophylaxis, or the signs and symptoms of VTE. If they are unaware of the significance of these signs and symptoms they may not share this observation with the healthcare team. In addition, creating an environment where the patient or family feels comfortable asking questions and raising issues to clinicians promotes good communication and patient safety.

Secondary Driver: Utilize protocols for anticoagulation.

One of the causes of delays in treating over or under coagulation is that without appropriate medical staff policies the nurse and pharmacist cannot respond in a timely manner. Instead of being able to stop the anti-coagulation, give reversal agents, or increase dose, they may instead spend time trying to reach the treating physician, all while the patient continues to be at further risk.

Change Ideas:

• Allow nursing to hold heparin or administer Vitamin K via approved protocol based on the most recent lab value.



- Allow pharmacists via approved protocol to adjust unfractionated heparin and warfarin based on current lab values.
- Involve patients and families in the design of patient education materials.

Suggested Process Measures

- The number of out of range lab values in one week for patients receiving prophylactic anticoagulation
- The number of patients who are able to verbalize the warning signs of their treatment and what they need to do should they occur

"Hardwiring" identification and mitigation of failure as part of improvement plan:

Create and approve medical staff policies that allow pharmacists and nurses, in certain situations, to stop or adjust coagulation doses based on the most recent lab values without contacting the physician first. Develop a "closed-loop" system for critical values that identifies all steps to rectify the problem and ensure it is managed appropriately. Periodically audit the process to ensure it is functioning as a closed-loop.

Smart Use of Technology

Technology, used smartly, can drive improvement. Technology must be designed and implemented in a way that is consistent with human thinking and human workflows, while at the same time eliminating or mitigating common sources of human error.

Secondary Driver: Link order set to risk stratification tool.

This is perfectly suitable for the smart use of technology. When the clinician completes risk stratification, the technology automatically leads the clinician to the recommended choices of orders for that risk stratification.

Secondary Driver: Link order set to recent lab values.

Based upon approved medical staff policies and procedures, laboratory results can prompt the clinicians to alter the therapy. For example, with a medical staff policy that allows the nurse or pharmacist to alter an anticoagulant dose if a specific lab test is outside of accepted range, the drug can be immediately reduced or stopped, preventing or mitigating harm.

Secondary Driver: Use alerts but understand alert fatigue, roles of soft and hard stops.

Alerts can be useful, but if overused for less important and more trivial issues, they will be ignored. This undesired result is alert fatigue.

Secondary Driver: Use alerts for weight based dosing for heparin.

Some protocols dose heparin by weight. While slightly more complicated, weight based dosing can be more effective, particularly in populations with widely varying BMIs. The electronic record can easily prompt recommended dosing by using the entered patient weight. This also allows the pharmacist to double check the dose.

Secondary Driver: Real time, monitor and mitigate medication administration timing.

Electronic medication administration tools allow charge nurses and pharmacists to run real-time reports regarding delayed administration of medications. Delayed administration or missed doses of an anticoagulant could have significant consequences for the patient. Catching and mitigating these delays in real time can improve the efficacy of prophylaxis. In addition, analyzing the data may lead to insights that promote changes in the systems of medication delivery that, over time, decrease the incidence of delays



Secondary Driver: Use "smart pumps" to minimize dosing errors.

Smart pumps can alert clinicians to potentially unsafe drug therapy prior to drug administration. The smart pump is designed to fuse traditional infusion-pump technology with predetermined clinical guidelines and IV drug administration protocols. If the program choices are outside a designated range, the pump sounds an alarm, indicating a "hard stop" or "soft stop" warning. A soft stop allows the infusion to continue without the need for dosing choices to be reentered. With a hard stop, choices must be reprogrammed according to pre-approved dosing guidelines.

Change Ideas:

- Capture accurate weights on all patients on prophylaxis.
- Pharmacy receives patient weight with VTE prophylaxis order.
- Use proper level (think seriousness or significance!) of alerts with forcing functions, stops, acknowledgement and drop down opt-out list for drug, allergy and diagnosis interactions.
- Use EMR real time reports to send electronic alerts when dosing occurs outside specified window.

Suggested Process Measures

• The percent of patients stratified to moderate or high-risk that receives appropriate prophylaxis orders

"Hardwiring" smart use of technology as part of improvement plan:

The challenge is to hardwire these electronic processes into the clinical processes. If the processes are ignored then safety opportunities are lost. There are many reports of numerous workarounds by staff using the electronic bedside medication verification method. This obviates the effectiveness of the built in safety intelligence. Again, the appropriateness of alert levels is key. If the intelligence of electronics is not germane to the clinician acting at the point of care then the value of electronics will be lost for these specific alerts. To compound the danger, conditioning may cause the clinician to ignore other sources of intelligence support of as well.

Potential Barriers

- Recognize that for some physicians this will be a change in their practice. Traditionally all clinicians have
 underestimated VTE risk. Physicians may resist pharmacist input regarding anti-coagulation. Some
 physicians may not be used to consulting pharmacists. As a result they may be unaware of what the
 organization's pharmacists' experience and knowledge is regarding VTE prophylaxis. Targeted modalities of
 education to the physician staff may be necessary for adoption to occur.
- Some physicians may be uncomfortable with pharmacists reviewing orders. Physician and pharmacist education, supported by approved medical staff policy that delineates the pharmacist's latitude and communication back to the ordering physician will help overcome these barriers.
- Clinicians may resist a process stop that requires reassessment of VTE risk at transfer to a different level of care. Education and academic detailing by physician champions is key. In addition, dissemination of stories of early successes, where the stop resulted in appropriate changes of VTE risk and prophylaxis that might otherwise not have occurred, is often very helpful.
- Technology can become burdensome. It is important to use technology intelligently.
- Some clinicians may resist adoption because the process is too complicated. Facilitate adoption of VTE protocol/order set by anticipating the common reasons for contraindications and make those opportunities clear on the order forms. Make sure that the factors you adopt as contraindications are supported by current evidence.
- These processes will be new territory not only for physicians, but also for many nurses and pharmacists. Nurses and pharmacists may be concerned that they may make a mistake, that they are not adequately trained to follow the policy, or that the medical staff will not be receptive and may become angry.



Education of all parties, both about the risk of delayed intervention coupled with the efficacy of immediate intervention will help mitigate this. Using the concept of "first line responder" may help cross these hurdles.

Use administrative leadership and sponsorship to help remove or mitigate barriers:

- Implementing VTE reduction practices changes will require strong physician, pharmacy and nursing champions, often from each area in the hospital that is affected.
- A management executive sponsor, recognizing the value to the patients and the value to the organization of preventing VTE and its complications, can help brainstorm solutions to what may appear to be added work, or provide resources to mitigate that additional work.
- Senior physician, senior nursing and senior pharmacy management will be critical to the success of new innovations. These may be perceived as something punitive (timeliness audits), something new and unfamiliar (consult a pharmacist?), or additional work (cover the floors too?) Executive sponsors can help educate, lead, and provide solutions to staffing barriers.

This is not just a change in practice but may also be a change in culture:

- This may very well require a change in culture, particularly physician culture. The physicians will be asked to trade their traditional way of individualizing both risk assessment and prophylaxis for each patient for a more standardized and effective approach. This may appear to be both a loss of control as well as irresponsible to give up that control.
- Order sets may make some physicians uncomfortable who are not used to them. This will be a change in how they work. Physicians learn from peers. Most physicians will follow their peers before they will follow "expert advice."
- Some physicians are not used to consulting pharmacists for treatment decisions. They will often be unaware of what the pharmacist has to offer. This is a good example of an innovation that will require small tests of changes and planned spread driven by success.

Tips for How to Use the Model for Improvement:

- Tips on identifying barriers to timely anticoagulant administration:
 - Design and conduct a very quick assessment of the last 20 doses of anticoagulants on VTE patients.
- Tips on mitigation of error:
 - Look at data or listen to stories about how long it takes at times to contact the physician to get orders changed when lab results are out of range, along with any patient safety consequences of these delays.
- Tips for developing and implementing risk stratification and VTE prophylaxis order sets:
 - Ask one or two of the physicians on the committee to trial this with their next three admissions and start in one unit.
 - o Reconvene and huddle after these trials and see if your tool needs to be modified.
 - Order sets: Design a small pilot on the unit where the lead physicians and nurses are comfortable with testing this innovation.
 - Try it with a few patients, possibly setting the out of range orders more extreme than what might be ideal based on the literature.
 - For example, you might start by allowing nurses or pharmacists to stop warfarin when the INR >6.0. Once the team achieves comfort, familiarity, and confidence, and experiences success, you can begin to lower the INR at which they can act.



APPENDIX I: SIMPLIFIED VTE PROPHYLAXIS 2012 10,16,21,26,30

Principles:

- Sensible prophylaxis works in moderate-risk and high-risk patients.
- Bleeding concerns are overestimated.
- The prophylaxis protocols must become a routine part of the patient care culture.
- Every hospital should develop a formal strategy that addresses the prevention of VTE's
- Simple works:
 - o If not simple, opportunities will be missed and errors are more likely to occur.
 - When prophylaxis methods are equivalent, choose the method that simplifies the overall approach.
- Recognize that clinically acceptable alternatives exist.

Recommendations: (normal bleeding risk)

VTE Risk: Low	Medical: fully mobile, brief admission Surgical: procedure <45 minutes, mobile	No specific prophylaxis Early mobilization
VTE Risk: Moderate	Medical: bed rest, sick Surgical: major general, urologic or gynecologic procedures	LMWH (Grade 1A) ⁱ Start post-op Continue until discharge
VTE Risk: High ⁱⁱ	Major orthopedics ⁱⁱⁱ Major trauma	LMWH ^{iv} Continue for up to 35 days (Grade 2B) THR, TKR: Start 12 hours pre-op (Grade 1B) HFS: Start >4 hours pre-op if surgery delayed

ⁱ LDUH is also Grade 1A¹⁶

ⁱ Addition of mechanical prophylaxis to LMWH in patients at high risk for VTE may be beneficial (Grade 2C)¹⁶

¹¹¹ The AAOS states there is not enough evidence to distinguish between pharmacologic prophylaxis options.²¹

¹^v The ACCP states that Fondaparinux and LDUH are now Grade 2B. ¹⁶ The AAOS states there is not enough evidence to distinguish between pharmacologic prophylaxis options. ²¹



Recommendations	: high	bleeding risk:
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Active bleeding	Use mechanical prophylaxis, preferably IPC (Grade
Known major bleeding disorder	2C)
Platelet count <50,000	Re-evaluate and add LMWH when bleeding risk
Intracranial bleeding in prior five days	subsides. (Grade 2C)
All neurological and spinal surgeries	
Heparin induced thrombocytopenia	

Notes:

- Inferior vena cava filters are not indicated for VTE prophylaxis and will increase DVT risk.
- Routine calf ultrasound surveillance for DVT not indicated.
- IPC's generally preferred to GCS's but may be tolerated less, have lower compliance by patients and staff, and be more costly. Calf length preferred because of better compliance and fewer infections.

Abbreviations used:

- GCS Graduated compression stockings
- HFS Hip fracture surgery
- IPC Intermittent pneumatic compression
- LDUH Low density unfractionated heparin
- LMWH Low molecular weight heparin
- THR Total hip replacement
- TKR Total knee replacement
- VTE Venous thomboembolic events



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